



# Objectives are Subjective

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**B**esides being very actual and controversial, the problematic of risk management and decision-making raises again questions about human capabilities of planning and achieving planned goals. This paper is intended to indicate some possibilities to approach risk assessment and risk management according to the transdisciplinary (TD) methodology, in a more accurate and at the same time, more consistent and more effective way.

**Keywords:** risk, decision-making, object, subject, transdisciplinarity.

## 1 Introduction

Historically, several attempts were made to understand and even formalize the risk assessment processes and the subsequent decision-making. Similar attempts are still made today. Both risk management practitioners and theorists are facing multiple challenges arising from the inherent limitations of disciplinary approaches, since current developments in this area don't provide significant improvement of practices and understanding of risk and decision making processes.

Usually, the most common risk definitions empha-

size elements of uncertainty and/or magnitude of impact and consequently, trigger approaches, concepts, methods and measurements of the same nature. These are the methods used today. At the same time, many disciplinary perspectives involve sophisticated concepts and methods, as applicable. However, today it is already obvious that the increased complexity of human activities has shown the "limitations" (read: failures) of the approaches used currently. Failures are not due only to the intrinsic reductionism of the disciplinary approaches. One of the main causes is of a fundamental nature, since "risk" is neither (and cannot be) absolutely objective, nor absolutely subjective. Therefore, "risk" doesn't have a standalone existence either objectively, or subjectively.

## 2 Beyond definitions

Academic research, Figure 1 [1] indicates that a relationship between "planned" and "achieved" can belong to three domains, "[...] one "pole" on this scale is deterministic. [...] The opposite "pole" is pure uncertainty. Between these two extremes are problems under risk. [...] (see Figure 1).

<b>Ignorance</b>	<b>Risky Situation</b>	<b>Complete Knowledge</b>
<b>Pure Uncertainty</b>	<b>Probabilistic</b>	<b>Deterministic</b>

Figure 1: Decision-making domains.



Figure 2: ERM goals are different for different industries.

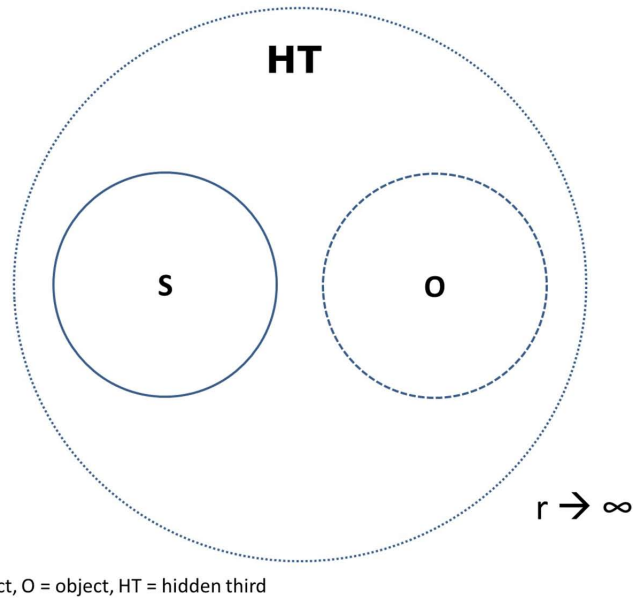
This type of classification is rigorous and very useful within the accepted boundaries, but nevertheless, limited. It is an intrinsic limitation, due to the mere disciplinary nature of the approach. It does not (cannot and doesn't have to) cover the variety of uncertainty types, as encountered in our common experience.

Without comparing the deterministic domain and the domain between "probabilistic" and "pure uncertainty" and solely relying on common experience it can be said that uncertainties are of many different kinds, belong to many areas and reveal the complex nature of the problem.

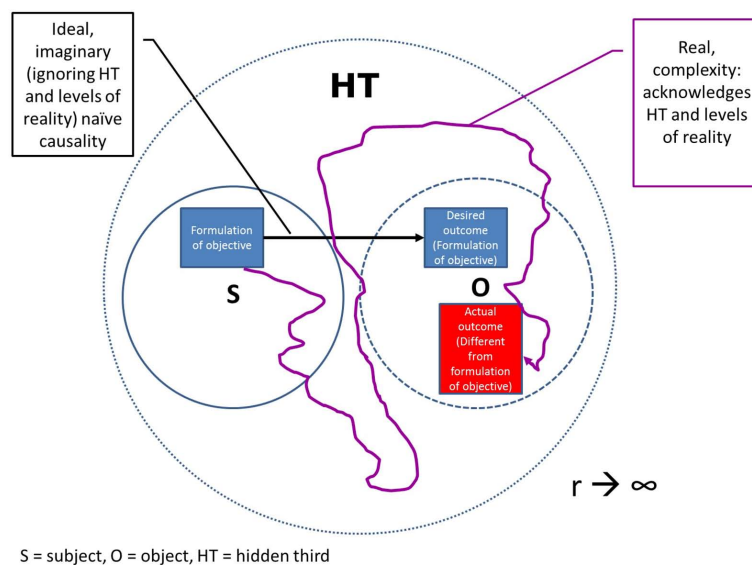
In order to deal with complexity, it seems necessary to use another approach since the current ones do not (cannot and don't have to) cover the description of the context for the decision-making process, the formulation of an objective (as a distinct process), nor the decision-making process itself.

The most recent and very rigorously elaborated definition of risk [2]: "Risk: 'effect of uncertainty on objectives'" illustrates/ re-discovers in a very pragmatic manner, the fundamental need for a subject and an object, as well as of their interaction. Similarly, the activities aimed at managing risks are also defined through: "Risk Management: 'Coordinated activities to direct and control an organization with regard to risk.'" Such a dependence on the subjective definition of an objective is demonstrated in many instances, but for illustration purposes only, I have chosen the following example in Figure 2 [3], entitled "Corporates mean different things when they talk about enterprise risk management",

Without an objective (formulated, validated and pursued by some "subjective" entity - could it be otherwise?) risk cannot exist. To better illustrate the interaction of the three elements, I use Figure 3, an adapted form of the graphical representation of the Subject - Object relationship [4].



**Figure 3:** Subject-Object relationship.



**Figure 4:** Relationship between “formulation of objective” and “outcome”.

Since “formulated objectives” are subjective, the emergence of “risk problematic” is possible only in the subject area, whereas the “result: effect of uncertainty” is supposed to belong the object area (Figure 4).

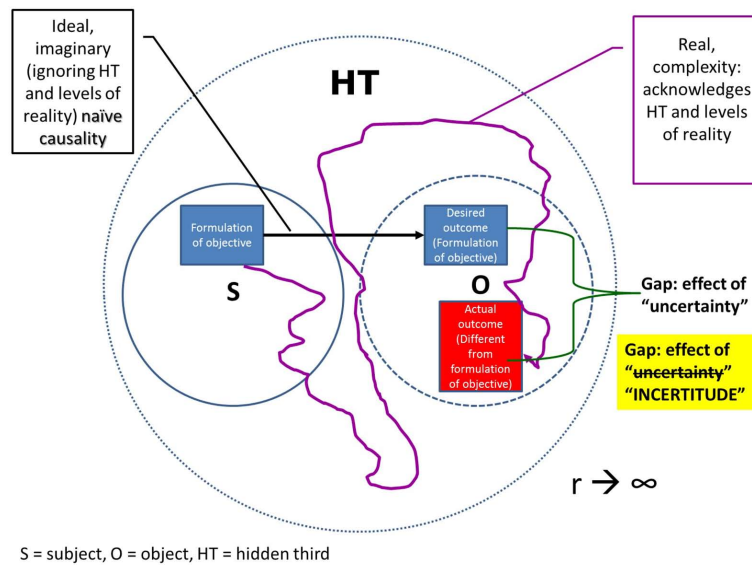
An ideal cause-effect relationship, deterministic and even probabilistic in nature is represented through a black arrow. As mentioned above, such relationships are quite seldom in our common lives since our lives are complex. An honest evaluation can show that decision-making in the context of e.g., roulette gambling or variations of the stock exchange

markets are less complex than decision-making related to our daily survival, and of course less frequent. Therefore, it is no exaggeration to state that such “straight-line” (ideal) relationships are an exception, a mere accident, whereas the real relationship could be “described” by means of the purple line.

Figure 5 shows the gap between “desired” and “achieved” or to follow the definition above, “the effect of uncertainty on objectives”.

But again, what uncertainty?

Our planning and decision-making processes are inherently affected by uncertainty. Following the TD



**Figure 5:** Gap between “desired” and “actual” outcomes.

methodology, it is possible to acknowledge that the inherent “sources of uncertainty” could be attributed both to the nature of the Subject-Object-Hidden Third interaction (Figure 3) and to the zone of non-resistance between the levels of reality of the Subject and of the Object. I used the quotation marks, because discovering under this disguise (i.e. as a “source of uncertainty”) the action of the Hidden Third in relation to the Subject and the Object is at least, astonishing.

At the same time, the “uncertainty” attributed to the zone of non-resistance between the levels of reality is more apparent through the obvious biases pertaining to the identification and evaluation of risks, as well as to the planning of treatment actions, both on the Subject and Object sides. This aspect is outlined especially through the recognition of biases and the acceptance of their impact on risk assessment and decision-making [5].

These considerations are far from being just theoretical, or of epistemological relevance. It can be firmly stated that corporations today started to acknowledge the impact of biases and either accept it, or attempting to reduce or avoid it. “[...] debiasing business decision making has drawn board-level attention, as companies doing it are achieving marked performance improvements. [...] Group psychological behavior produces some of the most powerful biases in business settings. Group dynamics can cause managers to sacrifice reasonable dissent to enhance their associations, maintain the favorable

perceptions of others, and keep competitors at bay. They may recognize but choose to ignore flaws in the analyses and proposals of their allies, so these kinds of biases are not cognitive in nature – they do not relate, in other words, to the acquisition and assimilation of knowledge. Rather, they are generated by the group setting itself, in which managers almost consciously relinquish good logic as they compare and evaluate options for action. [...]” [6].

Figure 6 [7] illustrates better the considerations above, while assuming that an event is defined as A: “Objective completely achieved as desired” (blue square), whereas its opposite (logical negation) is non-A: “Objective not completely achieved as desired” (red square).

It could also be said that within the accepted structure of Levels of Reality (LR) the problematic situation might be illustrated by means of two epistemological ternaries: Subjectivity – Objectivity – Complexity and Intellect – Body – Emotions/Feelings in relation to evaluating and prioritizing decisions and activities. The next paragraphs will outline an improved classification of the uncertainty types as well as of the risk treatment activities.

### 3 Re-formulation of the problematic situation

From a disciplinary perspective, one of the most relevant classifications of uncertainties is presented in [8], Figure 7.

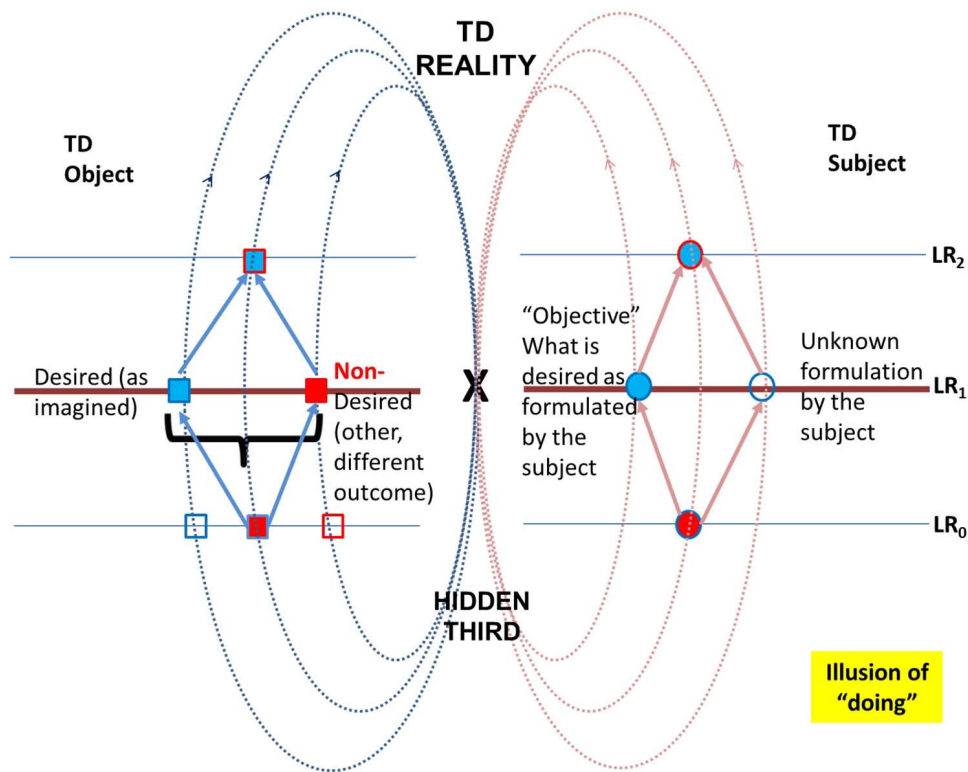


Figure 6: Levels of reality; gap between “desired” and “actual” outcomes.

		KNOWLEDGE ABOUT OUTCOMES	
		Well defined outcomes	Poorly defined outcomes
KNOWLEDGE ABOUT LIKELIHOODS	Some basis for probabilities	<b>Risk</b>	<b>Ambiguity</b>
	No basis for probabilities	<b>Uncertainty</b>	<b>Ignorance</b>

**“INCERTITUDE”**

Figure 7: knowledge of outcomes, likelihoods and “incertitude”.

While fully acknowledging the “effect” of the Hidden Third in all aspects of knowledge and their combinations as outlined in this table (and the relevance of both epistemological ternaries), it is also possible to ascribe specifically to each type of knowledge

(respectively, about likelihoods and outcomes) the impact of non-resistance zones between the Levels of Reality of the Subject and of the Object (where the ternary Intellect – Body – Emotions/ Feelings is particularly relevant). Treatment actions would be

adapted accordingly.

The same paper includes the following descriptions of the combinations derived from the degree/ quality of knowledge of likelihoods and outcomes:

- “[...] RISK is the zone where outcomes and likelihoods are reasonably well known. This is the region of risk analysis or risk assessment, where various outcomes are looked at for the ‘dangers’ that they carry.
- UNCERTAINTY applies where there are no firm bases for probabilities, yet some reasonably clear idea as to outcomes should an adverse probability come into play.
- AMBIGUITY applies to circumstances where the outcomes are not clear, but there is evidence of likelihood that is reasonably well known.
- IGNORANCE applies where there is an innovative technology or a product or substance that is synthesized and is not replicated in nature, and where there is no history of cause and outcome to predict consequences. This means that science cannot, by its own rules predict either likelihood or outcome. [...]”

Recent surveys [9] indicate a close correlation between improved performance of investment decisions and five elements that are directly connected to the subjective aspects of decision making for investment. However, some survey results indicate that “[...] when deliberating over investment and other strategic decisions, managers have many practices at their disposal to ensure sound decision making: presentation of information that contradicts leaders’ views, for example, and explicit discussions of the range of potential outcomes. Only 60 percent of respondents agree that decision makers explicitly discuss uncertainties when making resource-allocation decisions. And only 41 percent agree that their companies consider a range of potential outcomes or scenarios for a given investment.”

To illustrate the potential for improvement, one has to note that even in the case of evidence-based decision making only “[...] when asked which specific techniques their companies’ managers use to improve decision making, the largest share of respondents, 59 percent, cite scenario analysis. But no more than one-third cite any of 12 other commonly referenced checks on biases, such as pre-mortems,

postmortems, and explicit meeting rules. (We define “pre-mortems” as an analysis of what can go wrong or right before the project is under way and “postmortems” as an analysis of what went wrong or right after the project is completed. “Explicit rules for meetings” could include getting all ideas onto the table before discussing and/or the CEO expressing his or her opinion after everyone else on the management team or group has done so.) Nevertheless, the results suggest that the use of such techniques can lead to better performance. Respondents whose companies make the most use of evidence-based decision making are 36 percent likelier than their peers whose companies don’t use these techniques to report growing faster than competitors. And they are 22 percent more likely to say their companies are more profitable. [...]”

Therefore, using the TD methodology has a significant potential for improving both the techniques for decision making and the decision-making process itself. A more detailed presentation will be made available in a separate article. For the moment, I will use Table 1 to outline the connection between the above mentioned disciplinary findings (types of uncertainty), treatment strategies and the TD concepts (since all concepts in the TD methodology are applicable, I indicate only those of immediate relevance and manifestation on the correspondent type of “incertitude”).

Management strategies will be improved specifically based on the TD concepts and using the epistemological ternaries for contextualization. In this respect an important part is played by the description/ characterization of risks and “incertitude” types. The next section will provide more detail about description and risk dimensions.

Of particular relevance for the potential TD developments are the articles and working papers published by Andreas Klinke and Ortwin Renn since their approach is already interdisciplinary [10]: “[...] The interdisciplinary risk estimation comprises two activities:

1. Risk assessment: producing the best estimate of the physical harm that a risk source may induce;
2. Concern assessment: identifying and analyzing the issues that individuals or society as a whole link to a certain risk. For this purpose the repertoire of the social sciences such as survey methods, focus groups, econometric analysis,

**Table 1:** “Incertitude” and Concepts of TD Methodology

Type of “incertitude”	Management strategy	TD concept
Risk	Science based	Levels of Reality (Subject Object)
Uncertainty	Precautionary	Levels of Reality (Subject Object), non-resistance zone
Ambiguity	Precautionary/ Discourse based	Levels of Reality (Subject Object), non-resistance zone, Hidden Third
Ignorance	Precautionary/ Discourse based	Levels of Reality (Subject Object), non-resistance zone, Hidden Third

macro-economic modeling, or structured hearings with stakeholders may be used.

There are different approaches and proposals how to address the issue of interdisciplinary risk estimation. The German Advisory Council on Global Change (WBGU) has developed a set of eight criteria to characterize risks beyond the established assessment criteria [...]. Introducing the process of “concern assessment” facilitates the introduction of other risk dimensions and provides a starting point for a TD approach since consideration is given also to “framing” [11].<sup>1</sup>

## 4 If Risks Exist, These Have More Than two Dimensions

Commonly, for the description and communication of risks, special emphasis is put on two dimensions relevant to the specific risk scenario: magnitude of impact/ effect (adding “on objectives” according to above mentioned definition) and likelihood of occurrence (already detailed in the previous section).

Klinke and Renn [10] suggest the following criteria/dimensions:

“[...]

- *Extent of damage:* Adverse effects in natural units, e.g., death, injury, production loss, etc.
- *Probability of occurrence:* Estimate of relative frequency, which can be discrete or continuous.

<sup>1</sup>According to Robert Entman, to frame is “[...] to select some aspects of a perceived reality and make them more salient in a communication text, in such a way as to promote a particular problem definition, casual interpretation, moral evaluation, and/or treatment recommendation for the item described [...]”

- *Incertitude:* How do we take account of uncertainty in knowledge, in modeling of complex systems or in predictability in assessing a risk?
- *Ubiquity:* Geographical dispersion of damage.
- *Persistence:* How long will the damage last?
- *Reversibility:* Can the damage be reversed?
- *Delay effects:* Latency between initial event and actual damage.
- *Potential for mobilization:* The broad social impact. Will the risk generate social conflict or outrage etc.? Subcategories here are:
  - *Inequity and injustice* associated with the distribution of risks and benefits over time, space and social status;
  - *Psychological stress and discomfort* associated with the risk or the risk source (as measured by psychometric scales);
  - *Potential for social conflict and mobilization* (degree of political or public pressure on risk regulatory agencies);
  - *Spill-over effects* that are likely to be expected when highly symbolic losses have repercussions on other fields such as financial markets or loss of credibility in management institutions.[...]”

Of particular interest for using a TD methodology in the future approaches are the names from the Greek mythology used by the authors for risk categories. These names are not only very illustrative, but describe in a much more accurate way the Subject-Object relationship. While considering the already classical “impact-likelihood” dimensions it is possible to see in Figure 8 [12] a good indication

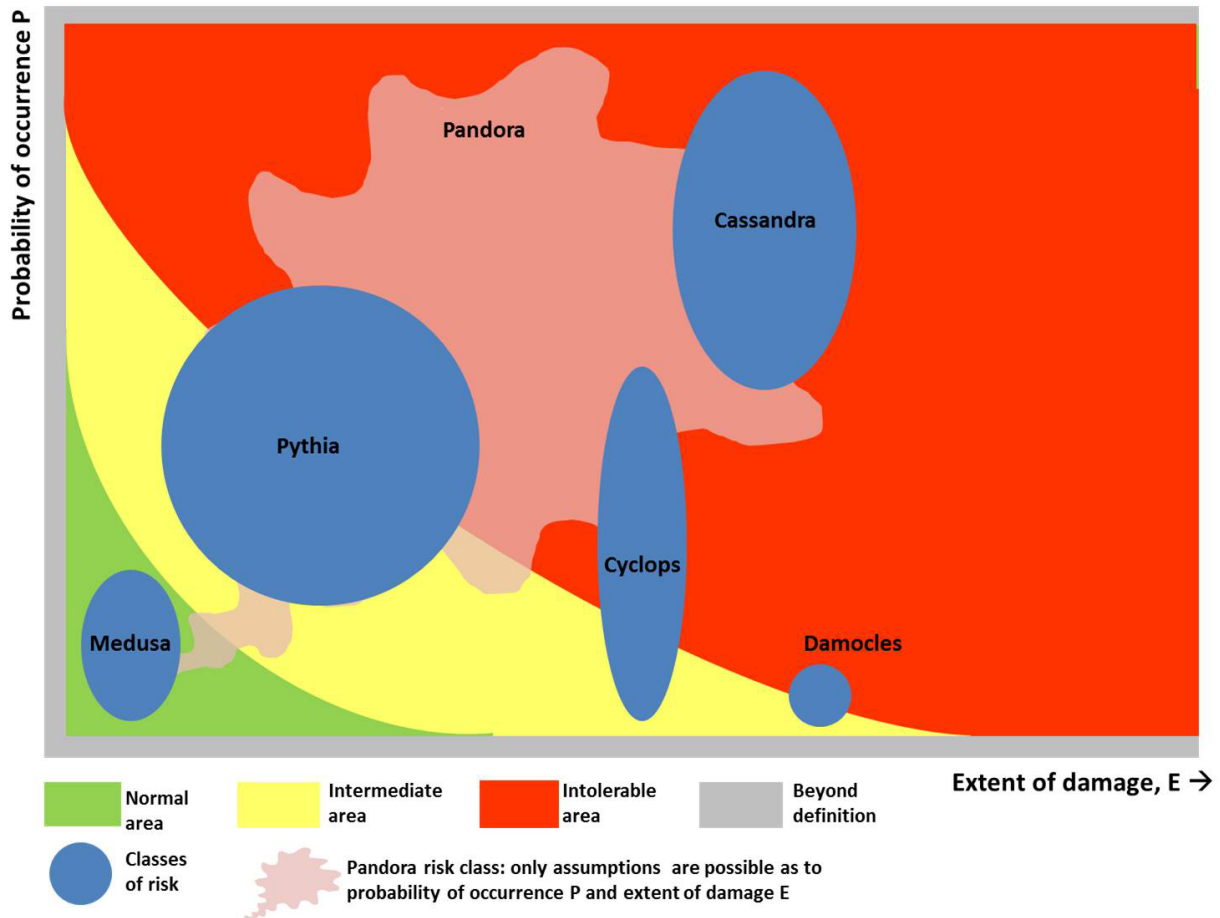


Figure 8: knowledge of outcomes, likelihoods and “incertitude”.

of how several dimensions are used for improving the risk classification.

In the same article, the authors state “[...] they (myths, T.N.) are, however, reminders of the genuine forces that are inevitably present in the making of new technological eras. They can guide us through the clouds of uncertainty and ambiguity associated with new scientific advances and technological breakthroughs. Far from providing recipes for managing technologies and risks, they can help us to orient ourselves in the tension between courage and caution and to create powerful images that provide sources for understanding and handling risks in modern societies.

Also [13], “[...] Although history has recorded numerous examples of unwarranted anxieties, there have been equally worrisome accounts of overconfidence in allegedly fool-proof safety measures and human abilities to cope with disasters. The responses to the change of technology over time seem to oscillate between the carelessness of Epimetheus and the

foresight of Prometheus, between the real disasters of Pandora’s box and hope, the ultimate gift of the gods to humankind. [...]”

And it is remarkable to note that in the field of risk management researchers and practitioners started to accept the limitations of the so-called “scientific” or “objective” approaches and try to fundamentally improve their practice and research. The TD methodology allows this improvement of a fundamental character [14], since “[...] Transdisciplinarity means “beyond” disciplines not in the sense of dismissing them but removing their intrinsic claims to a single knowable reality and epistemology. [...]”. I am quoting this article, as it contains a similar description of the effort to re-discover a more accurate and at the same time, sincere Subject-Object relationship: “[...] Like psychology itself, “literary studies” was invented in the nineteenth century under the influence of the proliferation of disciplines sponsored by the dominance of empirical science. These new disciplines were the “Social Sciences,” meant to em-



ploy the objectivity of science to human and cultural matters. Objectivity means just what The Red Book laments. That Jung had found the human soul [15]: “I had judged her and turned her into a scientific object.” Similar “objectivity” [14] pervaded literary studies in the twentieth century with the determination of its “New Criticism,” that the text was an object, sufficient in itself to generate knowledge with no participation from either the personality of its author or its reader. [...] Here we see disciplinary division as a primary severing of being. [...]

Therefore, based on interdisciplinary research and after acknowledging the need for a better classification and description of risks, the basis is set for a TD approach.

The potential for TD developments is described in the following table, synthesizing the categories of risks, their names, subsequent treatment strategies, epistemological ternaries relevant to the TD approach and derived from these, managerial actions (suggestions at tactical level).

Table 2 outlines several risk classes and treatment strategies and TD concepts are emphasized for each risk class. At the same time, our current experience could be summarized in the statement of Klinke and Renn [16], “[...] most risks are characterized by a mixture of complexity, uncertainty, and ambiguity. Smoking may be a good example for low complexity and uncertainty but high ambiguity. Nuclear energy may be a good candidate for high complexity and high ambiguity but relatively little uncertainty. Endocrine disruptors could be cited as examples for high complexity, uncertainty, and ambiguity. [...]”

It should be noted that strategies and tactics derived especially from the application of the epistemological ternary Intellect – Body – Emotions/ Feelings have an important role in dealing with ambiguity or ambivalence. By definition, TD methodologies will assist in (1) interpreting factual statements about the problem (e.g., mobile phones, pesticide residues in food) and (2) reconciling the differences in applying normative rules to a specific situation (e.g., ban or no ban on smoking).

Nevertheless, “[...] high complexity and uncertainty favor the emergence of ambiguity, but there are also quite a few simple and almost certain risks that can cause controversy and thus ambiguity. It is therefore important to distinguish between complexity, uncertainty and ambiguity: these three terms are correlated but they are not identical.”

## 5 Conclusions

The increased complexity of human activities has shown important and costly limitations in the field of risk management and decision making. The article shows the possibility to connect findings from disciplinary and interdisciplinary research and practice in order to develop a transdisciplinary (TD) approach. Based on TD methodology it is possible to improve both the techniques for decision making and the decision-making process itself.

Current and future results of research and practice will be presented in detail as a continuation of this article.

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**Dr. Cantemir Mambet** is an independent advisor providing consultancy and training services to public and private companies with a strong focus on risk, QHSE (Quality – Health – Safety - Environmental) and change management. He currently works in the oil & gas industry, having more than 20 years as senior executive at regional and global level with Rompetrol and OMV Petrom. As an independent consultant and trainer he was and still is involved in several projects in North Africa, Middle East, Western Europe (France, Belgium), Eastern Europe (ILO projects), Canada and the U.S. Dr. Mambet has also several years of experience in the aerospace industry and QHSE auditing.

Table 2: Risk Classes and Concepts of TD Methodology

Management	Risk class	Extent of damage	Probability of occurrence	Ambiguity	TD concepts Contextualization/ TD epistemological ternaries	Strategies for action at tactical level
Science-based (Complexity)	<i>Damocles</i> (technological risks such as nuclear energy, large-scale chemical facilities and dams)	high	low	Low	Levels of reality (O); Subjectivity – Objectivity – Complexity	<ul style="list-style-type: none"> <li>• Reducing disaster potential</li> <li>• Ascertaining probability</li> <li>• Increasing resilience</li> <li>• Preventing surprises</li> <li>• Emergency management</li> </ul>
	<i>Cyclops</i> (earthquakes, volcanic eruptions, floods, appearance of infectious diseases, nuclear early warning systems)	high	uncertain	Low	Levels of reality (SO), non-resistance zones; Subjectivity – Objectivity – Complexity and Intellect – Body – Emotions/ Feelings (assessment of probabilities)	<ul style="list-style-type: none"> <li>• Implementing precautionary principle</li> <li>• Developing substitutes</li> <li>• Improving knowledge</li> <li>• Reduction and containment</li> <li>• Emergency management</li> </ul>
Precautionary (High incertitude)	<i>Pythia</i> (global warming, instability of the West Antarctic ice sheet, genetic engineering in agriculture and food production)	uncertain	uncertain	Significant	Levels of reality (SO), non-resistance zones; Subjectivity – Objectivity – Complexity and Intellect – Body – Emotions/ Feelings	<ul style="list-style-type: none"> <li>• Implementing precautionary principle</li> <li>• Developing substitutes</li> <li>• Improving knowledge</li> <li>• Reduction and containment</li> <li>• Emergency management</li> </ul>
	<i>Pandora</i> (human interventions in the environment also cause wide ranging, persistent and irreversible changes without a clear attribution to specific damages)	uncertain	uncertain	Significant	Levels of reality (SO), non-resistance zones; Subjectivity – Objectivity – Complexity and Intellect – Body – Emotions/ Feelings	<ul style="list-style-type: none"> <li>• Implementing precautionary principle</li> <li>• Developing substitutes</li> <li>• Improving knowledge</li> <li>• Reduction and containment</li> <li>• Emergency management</li> </ul>
Discursive (High ambiguity)	<i>Cassandra</i> (death, the delay effect leads to the situation that no one is willing to acknowledge the threat)	high	high	High (“Low” due to delay effect)	Levels of reality (S), Hidden Third; Subjectivity – Objectivity – Complexity and Intellect – Body – Emotions/ Feelings	<ul style="list-style-type: none"> <li>• Consciousness-building</li> <li>• Confidence-building</li> <li>• Consensus seeking</li> <li>• Public participation</li> <li>• Risk communication</li> <li>• Contingency management</li> </ul>
	<i>Medusa</i> (electromagnetic fields, eutrophication, smoking, extent of damage was assessed as low by most experts; neither epidemiologically nor toxicologically significant adverse effects could be proven. Exposure, however, is wide-ranging and many people feel involuntarily affected by this risk)	low	low	low	Significant	Levels of reality (SO), non-resistance zones; Hidden Third; Subjectivity – Objectivity – Complexity and Intellect – Body – Emotions/ Feelings