THE HOLISTIC CONCEPTS OF DISASTER MANAGEMENT AND SOCIAL COHESION - STATISTICS AND METHOD

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***Abstract**: The paper uses a multidisciplinary approach to underline the importance of some holistic concepts like social cohesion and human ecology, and also to assess environmental and economic specificity of these new ecological and social terms. The structure of the paper consists of an introduction describing the transition from mythological existence to the contemporary holistic view and four sections. While, the first section details the vital elements of the ecosphere in the new holistic sense, the second describes the holistic concept of human ecology, and the third details the significance, importance and impact of the contemporary management disasters and some global statistics. The last section summarize a statistical method known as the social cohesion evaluation, applied by the author in our country, during Romania's admission period to EU, that in conjunction with holistic concept of human ecology represent new necessary analysis in this decade. Some final remarks underline the importance of a new approach in economics based on holistic principle and reciprocity.*

Keywords: ecology; human ecology; disaster management; social cohesion.

Jel Classification Code: I32, O15, Q54, Q56, Z13

1. INTRODUCTION

Human nature and its organic thought have their economy, which cannot be ignored otherwise than at the expense of vitality and life on earth. Every civilization has its own kind of culture and its own unique conscience in human evolution. In fact, human history is nothing more than a long repertoire of significantly different combinations between culture and consciousness, redefined by today's systemic, integrating approach, so necessary for salvaging nature, the environment, the ecosphere and, above all, our own human nature. This long journey of thinking, of searching, sometimes sprinkled with moments of real understanding of the real position of humanity within the context of the environment (the ecosphere), is also a long oscillation between surviving and disappearing. The history of humanity errors and discoveries reveals that even our great-great-forefathers, or maybe the first inhabitants of the planet, may have perfected a certain form of culture and a particular form of social order, with the periodic transitions in the relations between them, and their relations with nature of being accompanied by a corresponding change produced in their concept of the vital elements of their environment, and about their relationship with the latter

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(i.e. earth, water, air, fire, which gradually became myths, vital elements, and, ultimately, ostensibly mere resources).

The transformation of the last two thousands years coincides with the change in technology, complemented by a concentration of resources and implicitly by the change of culture. Nature and people are now more separated or even opposed. The next transition, opened by the new metal melting technologies, and measuring the boundaries of the plots of land, the invention of calendars in order to keep track of time, and of writing, for inscribing and conveying messages, with an immediate impact on population growth and the complexity of social organization, generated a first pressure on the environment (the ecosphere). The circle of the gens and the tribe, as well as the responsibility of survival through maternal fertility (the matriarchate of birth in the human species was a defining factor for the primary consciousness of humanity) gave way to the layered-pyramid state characterized by formal hierarchical organization and strict discipline. A new thinking to the earth, similar to the heaven harmony, has generated new relation to the environment (the ecosphere) developed through networks of relationships that reached from the deepest parts of living and non-living nature to the most sensitive areas of human conscience, by a social order rooted in the cosmic principles, the consciousness of heaven and earth protection being much above human understanding. Thus another transformation appears as a way to other values, generated by the progress of different technologies and the sciences' revolution. The concept of quantitative measure arose, which provided human civilization with an inexhaustible trail to follow in knowing nature, with a major impact on the formulation of new theories based on observations and complex reasoning, and thus it have defined a new consciousness in relation to the environment (the ecosphere). But neither the Newtonian mechanistic law (the universality of the laws of motion, confirming that the environment is a divine world, like a clockwork set in motion by the primary force and working harmoniously and eternally according to the strict laws of nature apt to allow the rational mind to know the past, the present and the future), and nor the primacy of the Einstein relativistic law (where humanity, or the people, in their capacity as entities, endowed with mind and conscience, they are free to exploit, for their own profit, nature, environment, the ecosphere... In one respect however, the relativistic conception of the Logos became invincible in environmental issues. Albert Einstein was right when he noted that the problems created by the prevailing mode of thought cannot be solved by thinking the same way of thinking, that a society with relativistic Logos consciousness cannot find relativistic solutions to the problem of protection and survival of the environment (ecosphere). This is the result of a crucial insight into human current state. A new, viable civilization must generate the sustainable development of a culture and consciousness very different from the conception that characterized most of the last century, and an alternative is a human civilization centred on sustainable human development (of both communities, and the environment where those communities live). The new development will quickly choose between extensive development (which has generated an obvious inability to achieve sustainability, and is ultimately pointing towards chaos), and intensive development (which could urge human society towards a new operation mode, of a systemic, aggregate, holistic type). The contemporary transition, which has already started, can be found in Ervin László's model, presented in 2006, in his work titled *The Chaos Point: The World at the Crossroads*, and this transition is based on a holistic approach, promptly transformed into a major cultural force. The new Holism captures the deepest spiritual instincts: to fulfil oneself as a human being, to create healthy and complete communities, both local and global, to include and to think about all the aspects and dimensions of human nature, and also of the environment, to connect and feel that you are part of the whole meaning and the whole

mystery of existence, to feel part of a civilization in which people think and behave as responsible citizens of the planet that is their home. If, in science, Holism seems limited and overlaps on the principle that processes raw material or the units of unorganized energy of the world, uses and organizes them, endows them with a specific structural, a character and individuality, and finally, with personality, and creates beauty, truth and values for them, contemporary Holos is not completed before it solves numerous issues linked with the need or priority of standing economic and financial growth, just to keep them running and prevent them collapsing, structural and functional problems in the long term, yet based on success criteria for short reference periods, and the day-to-day progress of the environment (the ecosphere), quantifications of social and economic progress in terms of gross national product, but taking into account the quality of human life and the fulfilment of their human needs, conflicts starting with those connected with religious fundamentalism, to the "market fundamentalism" type, etc.

2. THE VITAL ELEMENTS OF THE ECOSPHERE IN THE HOLISTIC SENSE

The four cardinal elements of nature, philosophy, mythology, turned theistic or the foundation of religion, can be assimilated to defining the essence of ecology in general; they also became the subject of statistical investigations of an ecological content: the earth, or that reality that defines the specific purpose of studying of ecology, reconsidered as a support of human nature's survival, then water, which superimposed on the clarity qualities of the essential requirements of human existence, air, which is practically identified with the specific breathing of the human being, born of the eternally virginal seed of life's present, and finally fire, which symbolizes the danger of violent degradation and its devastating impact on any environment (ecosphere), which it can turn to ashes... Weather and climate are manifestations of the natural environment, and are characterized both by their complex structure and their temporal variability, and the strong dependence they generate for regions and areas that are generally habitable. Terrestrial climate disasters are natural disasters caused by prolonged rains, prolonged drought, heavy snowfall, very high or extremely low temperatures, severe frost or strong wind. A natural disaster is the result of a combination of unexpected natural events (an event of a physical nature, unpredictable, which can be exemplified by a landslide, a hurricane, a tornado, a persistent heat wave, a dangerous fire, a violent snowstorm, or prolonged torrential rain) and derived human activities. Human vulnerability, in the absence of early behavioural philosophy, and a prompt and appropriate management, leads, in such cases of extreme necessity, to social and economic losses and, much more seriously, to human casualties. Ecology, in its contemporary sense, also holds a vast component of human ecology, and accordingly climate natural disaster management resulting from environmental degradation – and not only because of that – is an activity defined historically, having its own methods and tools, but also focused on statistical information in its major decision foundation.

A short mythological and environmental history of the vital elements of the ecosphere

Box no.1

The exhaustive approach to climatic variation, going to terrestrial climate disasters, cannot be rendered into a systematic and practical exposition, in the absence of the four elements considered essential: water, earth, fire and air, or when the mythological elements lack, which can give the necessary understanding of unrecorded and hyperbolized past, much less of the present descending from the past, or the future being born of the seemingly virginal seed of the present. The religious approach contained in the Bible reveals, above all, a personal and omnipotent God, pre-existent in relation to water, air, fire and earth, all of which were created by the primary divine Word. The first Bible verse confirms that in the early creation by God of heaven and earth, through the work of the divine hands, the earth was without form and void. The religious cosmos or the universe, thus created, was defined in three dimensions: the Biblical space consisted of the

heaven or the skies (meaning made of rarefied, thin air), the Biblical mass / weight or size was the very earth or land, and time was being born through he very idea of "beginning"). "In the beginning God created the heavens and the earth". In that primordial cosmos, the inner balance was established, in the spirit of a constant amount of energy in its aggregative or universal approach (in anticipation of the first classical law of thermodynamics). That primeval cosmos / space belongs to the heavens and the earth, but constantly becomes more chaotic through the intervention of water and fire, as elements of transformation and change (second law of classical thermodynamics). Job, the Biblical figure that makes the transition from the Old to the New Testament, even suggests the rotation of the Earth, changing, in his words, like the clay on which a seal is stamped (the divine potter's wheel manipulates the earth as if it were a clay pot revolved continuously, thus printing the pattern of a seal or hallmark. Religion insists on the perishability of heaven and earth, which will perish in time, while God's word will never pass away. The Book of Revelation in the Bible describes angels as being able, in God's dominion, to unleash terrible natural phenomena such as hail, fire, and meteorites that can bring about even physical illnesses harmful to the human body...The Earth, present in all world mythologies, simultaneously symbolizes fertility, being in most cases a female figure, Ki, with the Sumerians, the wife of the sky, Gaia or Demeter with the Greeks, and, less commonly, a male figure, as was the case of Geb, in Egyptian mythology, and also the funeral or infernal earth, posthumously punitive, in which case it became predominantly male: the Greek Hades, Sheol in Hebrew, Djahanannam in Islam. The fertile-funerary bifunctionalism specific to that deity does not however prevent it remaining immortal. A Romanian cosmogonic myth describes the earth's emergence as a result of a cosmogonic diving: "Before the creation of the world there was a vast ocean of water over which God and Satan were walking. When God decided to make the earth, he sent Satan (to the seabed) to take the seed of earth from there in his name, and bring it to him above the water. Satan dived in the sea twice, but instead of taking the seed of the land in the name of God, as was told, he took it only in his name. When he rose back to the surface of the water, all the seed of earth slipped through his fingers. Only the third time, when he went deep down into the waters, did he take the seed of earth in the name of God. When he rose above the water, little earth remained under his fingernails, and the amount he had taken in the name of God, the rest was water-washed off his hands. With the earth that had remained under the nails of the devil, God made a patty-like lump of earth, on which he reclined to doze. Satan, believing that God was asleep, planned to overthrow him into the water and drown him, to remain the master of the earth, but the more he rolled him, the more the earth grew and spread under God". At least two Romanian proverbs have developed inherently in this context; the first says that God never sleeps, and the second that God's goodness in relation to people, like the breadth of the earth, seems to be boundless. But climate change, partly caused by massive deforestation, are already severely overtaxing the earth, generating landslides, or even turning increasingly extensive territories into desert or semi-desert areas...The eternity of water was integrated into initial chaos, being worshipped by the Sumerians as Nammu, the eternal god of the world's oceans, later renamed Nun by the Egyptians, then contaminated by the Phoenicians as Mot, or the symbol of the primary cosmic mud, renamed Apam-napat in the Aric pantheon, to be metamorphosed by the Greeks in the brother-sister pair who were to become husband and wife, Okeanos and Tethys, the terrestrial and the marine waters respectively, a discrimination which was required by both the seaman, and the Greek spirit. Chinese mythology personifies the two deities able to stem the universal flood, through either the goddess Nu Wa and her brother Fu Xi, or the dragon Yu. A different kind of water, having the symbolic value of impermanence, was used as a tool for measuring the flow of time. It will be imposed on the equally fragile history of humanity by the Babylonians, through their famous water clock, "literally" dripping the minutes; a clock consisting of a vessel which "weighed" three liters of water and marked the passage of six minahs, or six times two double hours, or to put it even simpler, a period of 24 hours...Propitious and life-giving, in its capacity as "live" water, or unpropitious in its capacity as an antechamber of death, like the Styx, ritual as a starting-point in world cultures and mythologies, our "everyday" water will gradually be transformed into a lustral or post-ritualistic water throughout the clerical Middle Ages, becoming magic in contact with the Christian cross, and finally sacred and oracular. The relativized excess of water gradually identifies itself with absolute fecundity and rebirth, as is the case of the Nile, turned, through the flooding, the water of reunification and of the resurrection of the Egyptian god Osiris, while absence of water is synonymous with the hell of prolonged drought, and the best example of which is the millennial toponym *Arabia*, which translates as "a barren place", a place, in fact, where it snows on average once every forty years. The disaster that is forever linked to water is its flood-related depiction or stance, the universal flood, present in virtually all world mythologies, in approximately 200 separate myths, from the ones woven around the Babylonian and Assyrian Utnapishtims, up to the episode of the miraculous rescue by Vaivaswata of the little fish, or the seventh holy Manu, in Vedic or Indian culture, and it is not absent from the Bible and the Quran, or the Greek legends having as a hero Deucalion, the son of Prometheus, and also the Greek alter-ego of Noah. The

oldest story or account of the universal flood, which has survived up to this day, was discovered among the remains of the clay tablets in Asurbanipal's library. In the eleventh tablet in the set of twelve containing the epic story of Gilgamesh, the tremendously impressive recalling of the flood episode belongs to his ancestor, Utnapishtim the immortal, the only human being released from death by the gods."The weather made a terrible sight. We entered the ship and closed the door... As soon as dawn broke, a black cloud rose from the brim of the horizon. It was from thence that Adad (the god of storm) threw his thunderbolt, while Shulla and Hanish (the names of strong winds) go ahead. They walk alongside those who are in charge of the mountains and the valleys. Irragal (or Nergal, god of the underworld) tears the masts, and breaks the dams. Then comes Ninurta (god of war), dispelling all those who stand in his way (after he opens the locks). The Anunnaks (other deities of the underworld) raise the torches, setting fire to the whole country with their blazing fire. The storm (the anger) unleashed by Adad reached up to heaven, and all the light turned into darkness. Brother cannot see brother, the people can no longer be recognized from heaven. For a whole day the storm struck viciously, and the waters covered the mountains. For six days and seven nights the wind struggled in tremendous rage, and the flood destroyed everything..." Another account, entitled Babyloniaka, mentioned in the era of Alexander the Great, belongs to the priest Berossos, and dates the flood in the fifteenth day of the month of Desios, or the eighth month of the Macedonian calendar, during the reign of Xisurthros, the tenth king of Babylon. The best-known and most popular of the accounts written about the flood is still the fragment in the Bible, although it appears that multiple, distinct sources were gathered there; Noah was saved by his ark after a flood of a length equal to one year of the hero's life, that is from the year 600, in the second month, the twenty-seventh day (Genesis, chap. 7, verse 11) until the year 601, the second month, the twenty-seventh day (Genesis, chap. 7 , verses 13 and 14). It can be said, according to the Biblical verses giving details, that that year of Noah's life is an almost contemporary calendar year of about 361 days, when adding the 40 days the flood itself lasted (Genesis, chap. 7 , verse 17) to 150 days, when the waters continued to rise on the earth (Genesis, chap. 7, verse 24), plus an additional 150 days when they receded and were drained away (Genesis, chap. 8, verse 3), and finally the 21 days while the Noah sounded for land (Genesis, chap. 8 verses 8-13). The Biblical Flood is the kind of global disaster that almost breaks up the world only to recompose a another, purified one; and here comes the divine promise that there it shall never be repeated: "...neither shall there again be a flood to destroy the people of the earth" (Genesis, ch. 9, verse 11). The variants of the flood myth become interesting by the temperature at which the disaster takes place, when diluvian water is scaled cardinally, now at normal rain temperature-rain, now at one of its limits, a hot, purifying water, as in the Quran, an eternal snow as in the Persian Avesta, or a succession of devastating snowfalls, giving rise to two cycles each consisting of three "Big Winters", as in the old Scandinavian / Norse Edda. Hydrology gives, in the context of contemporary science, the essentials of geology, reducing it, just as the earth depends religiously on water, as in the Biblical wording "the life of the body / flesh is in the blood". Hydrology dissipates almost histologically, discriminating, by oceanography, ocean water, by potamology – that of rivers, by limnology – the water in lakes, by geohydrology – groundwater, and by meteorology the phases of atmospheric water are cyclically integrated. Whether Biblical water is spirit or "ghost", in a word a living water, whether it is turned, through baptism, into life even in the absence of life, whether as an essential element of transformation it dominates the globe, and literally eats up the rocks, whether it is associated to cataclysmic flood, to disaster, in a word, to flood, or to Noah's rescuing ark, thus segmenting, pre- or post-flood, world history, water remains, in the memory of religion, the main direct object of the Biblical miracles, springing even from the rock (be it the rock in Meriba, or any other rock), the major support of energy, strength and power as in "walking on the waters", the constant element of ordering and hierarchy, as in the "parting" of the waters, or creating "water walls". Dried up, or sweetened as in Mara, blood-coloured or transparent up to absolute purity, bringing the fish, or ill-luck and foul stuff into the fishermen's nets, water is important even when missing, or perhaps especially then, that is in the desert... The history of the revaluation of past and present worlds, of the values of human society, and especially of their economy, is equally under the terrifying and red-glowing impact of fire. Purifying, or rather disintegrating language, culture and customs with the Chinese, in a frequently tragic and unwanted sense, it was to fire that most dynasties appealed to annul history. The distance from the Promethean fire, so revered, the sacred fire treasured and worshipped everywhere as the hearth fire, or from the solar fire, either in the masculine stance with the god Shamash with the Babylonians, or the Egyptian god Ra, or effeminate by Amaterasu in Japan, the distance between the causes and the consequences sometimes seems unbelievably great up to the paradise fire symbolized by lightning, which the Indians called Indra, the Greeks – Zeus, the Norse – Thorr, or up to the infernal Biblical fire of hell. That unparalleled gift of Prometheus offered to men, turned into premeditated hell in Nero's time, or a cultural disaster in Alexandria, is able to produce the most severe damage even today, in weather conditions favouring its emergence and development, in both urban agglomerations, and especially in areas less affected by human presence, lying under the heat of sun. The fire

in the Bible is devastating, apocalyptic, incinerating and purifying, burning the earth and bringing salvation to all that is on it. Fire becomes the essential element of Doomsday, and its importance in energy entropization brings it close to water. Death and Hades are also surrendered to death, being saved in a lake of fire. Fire and brimstone join heaven and become an eternal, immortal, unconsumed Biblical pyre, which equally swallows both Nadab and Abihu, and the offerings of Gideon and Manoa. The stone and fire fury relies on wind and earthquake to transform the world balance into a catastrophic Calvary. The infinite human spirit does not die, just like inextinguishable fire. Air, deified in its calm aspect as Shu, whom the ancient Egyptians placed between the deities Geb (the earth) and Nut (the sky), is the third major element of life, along with water and fire, providing, in terms of climate, dynamism or promoting stationarity for both. In its violent version, Huracan, in the Mayan civilization, it becomes the divine energy centre of the universe, totally different from Prana in Vedic mythology, the vital air, the primary inspiring / ghost-giving principle. The subtlety of Greek and Roman mythology rises air to the state of *ether*; Publius Ovidius Naso conferred it weightlessness, and placed it in the upper strata of the sky, in his *Metamorphoses* and *Fasti*. The Biblical meaning of the air is dual, as to the original concept of heaven the concept of air movement was gradually added. Wind thus becomes the essential expression of the air and its destructive dynamics, when stored and carefully taken out of its divine chambers, as described by Jeremiah, or redirected southwards, then turned northwards, and returned again to begin again and again the same spins, as presented by the ecclesiastical vision... But the biblical world is waiting for new heavens and new earth, or lands, wherein righteousness and purity will dwell.What is then the angle from which philosophy looks on the original material and its changes? Two of the three great philosophers of Miletus, Thales (624-546 BC) and Anaximenes (585-525 BC), developed their philosophical theories starting from a particular element that they considered vital, water and air respectively. Water represented with Thales the origin of any particular form of life, and also its end, very much as, with Anaximenes, air or the whiff / breath of air each concentrated the original and also final material of the world, the primordial material from which life arose. Furthermore, Anaximenes' theory combined, through the image of air, all the four essential elements, making up a chain of successive transformations. Thus, he considered water as condensed air, while rain water was, in his opinion, wrung or squeezed out of the air, the earth was nothing but strongly compressed water, and finally, fire was nothing but thin air. Anaximenes believed that air, water, earth and fire only exist so that life may exist. Hence, the philosophical journey nature meant to explain nature continues through cultural figures placed at the extremes, and defined as perfect opposites, viz. Parmenides (540-480 BC) and Heraclitus (540-475 BC): the former styled world as eternal, and implicitly its essential elements (everything in existence has already existed, and nothing can be born out of nothing), and the latter glorified eternal motion and change (everything flows), or the transformation of an element into another one. Empedocles (490-430 BC) was the one who would end the ancient philosophical approach, by explaining that all changes in nature occur because the four original elements or materials, which he called "roots", were mixed in various combinations, and then come apart, again and again... The idea of combination would subsequently be defined through the existence of germs or seeds by Anaxagoras (500-428 BC); eventually, Democritus (460-370 BC) would define the *atom* – the actual meaning of the term being "indivisible". In fact, Democritus closed a complete cycle of philosophical inquiry, essentially illustrative of the original matter and its primary elements or features, and also of change, and opening anew still other questions. Primary stability delineated climate, and primary instability – climate disaster. Water became, from the angle of science, the factor essentially responsible for floods, when prolonged or seemingly ceaseless rainfall occurred, covering a geographic area, following the very rapid melting of large quantities of snow in upland areas, the destruction of dams, landslides dislocating it out of lakes... Fire also turns into an unstable element, as dangerous as water. Drought, excessive heat and great fires / blazes were, and still are, a threat to society because they could easily get out of an apparent control, and expand rapidly in populated areas, causing the destruction of communities, as well as their natural environment (forests , orchards, grain fields, etc.). Land (and earth) offered, ever more frequently, causes of natural disasters, while air and its atmospheric circulation generated a large family of words that designated, gradually and subtly, natural disasters that everyone hears of more and more often: storm, cyclone, typhoon, etc. Their names were gradually personified by giving them human names, but their consequences in terms of the number of deaths is more than we can imagine.

Are indeed earth, air, water and fire the only elements leading, through excess or scarcity, to natural disasters? Aren't human activity, man and human society linked to these imbalances? Very much as the excessive atmospheric circulation of the air can generate dangerous densifications or sudden changes of speed or direction, leading to natural disasters, such as the commonplace storms (e.g. tropical storms, cyclones, tropical cyclones, hurricanes,

tornadoes, typhoons, etc.), so, or even worse, lack of air conduces to the disappearance of life itself. The dramatic effects of the climate disaster thus generated can be such as land destruction by the wind, the occurrence of landslides, floods, famine, and even death. Water in turn is responsible for flooding, where the presence is involved of prolonged rainfall over a geographical region due to the very rapid melting of large quantities of snow in mountainous regions or the destruction of dams. Snow avalanche is also the consequence of excess (frozen) water and threatens mountain communities worldwide. Extreme winters, through their very low temperatures, generate either very cold rains, which create layers of ice on the roads, or sleet or extended snowfall with disastrous effects. More unusual are the discharges of blinding snow light, which can temporarily bring visibility to near zero and endanger people. Drought, excessive heat and fires are as many threats to modern society because they can easily get out of control and monitoring, and can spread very rapidly in areas populated, at times resulting in destroying both the communities and their natural environment (forests, orchards, grain fields, etc.). Above and beyond all these aspects, it can be easily noticed that man, humanity or human society can affect, destabilize, degenerate, and even destroy the normal evolution of natural climate, thus becoming the main factor of the imbalance of the realities described with the rationality specific to the science of geo-physics, or the glaciality of the philosophical idiom. Human ecology thus becomes another component of general ecology, of the survival of both nature and human nature.

3. THE HOLISTIC CONCEPT OF HUMAN ECOLOGY

Despite the alleged similarities with plant and animal ecology, human ecology, as this is the direction to which the above considerations refer, does not consider or analyze ecological processes and phenomena proper, but rather social processes. Developed by the Chicago School, during the second and third decades of the 20th century, human ecology is one of the first rigorous systemic sociological approaches that considered the natural environment in explaining social phenomena; the intense promotion of human ecology was favoured by Robert E. Park, Ernest W. Burgess and Roderick McKenzie. The new direction was well under way to gaining full recognition after the world 2002 Summit in Johannesburg, South Africa. Ecology and solidarity thereafter became two inseparable elements, and, as ecology can only be a genuine sign of *human solidarity*, which "*obviously includes the protection and cultivation of land resources*" (according to the Vatican document on the World Summit for continued progress in Johannesburg - 2002), the new approach ought to be based on strong ethical values, otherwise the risk of total lack of direction may appear, disappearing the foundation on which the continued progress under investigation can be built and supported, as the very essence of development. The concept of continuous progress is connected with the quality of life and sustainable development, and it requires a process through which the needs of the present are met, without however compromising the ability of future generations to meet their own needs. Human ecology is circumscribed by a whole new perspective of *integral and systemic human development*.

The complete notion of human ecology primarily consists in ensuring and protecting the moral conditions in human action on the natural environment. The first and fundamental structure for human ecology is and will continue to be the *family*, where man gets the first formative ideas about truth and goodness, and where he learns what loving and being loved mean, and so what being a unique person means, thus forming their own matrix for the future intellectual energies, a matrix that will be completed in the later educational and cultural

processes. In this context, particular attention should be given to a kind of social ecology of human education, of scientific research, or human labour in general. To change the current angle on poverty by which the world's poor are rather a problem than some potential productive and creative actors in society, it will be crucial to create new employment opportunities, education, basic health care, or adequate housing conditions. Human ecology refers not only to economic development, be it sustainable, or only the quality of life described by ecological processes, but rather to social processes, with special emphasis on education, research, continuous cultural training, processes which, through a conceptual transformation, were biologized in order to explain social reality in terms borrowed from the natural sciences based on a holistic and systemic thinking. New models of consumption and production will have to be considered and promoted in accordance with the principles of human dignity and solidarity, from a specific angle specific to human ecology. The current crisis and global recession are the result of the too slow pace of change in the expected directions of human ecology. Contemporary human ecology redefines the human community, humanity itself, through the concept of anthropo-eco-system, as spatial distribution of the living environment of man, and its object includes conducting researches on a human population interacting with the environment, drawing the repertoires of the specific issues affecting human life, such as the harsh climate, natural reserves and the hydrological regime of the water sources, the chemical composition of the water from those sources, the character of the landscape, the vegetation features, the social-economic status, the traditions and customs, the degree of environmental pollution, the level of sanitation of the homes, providing the population with housing, specific activities, food, etc. Human ecology redefines the dignity of the contemporary individual, as a basic feature of the phenomenon of human uniqueness compared to the rest of creation, meaning that man was created after the "image and likeness of God", without however attracting individual selfishness. "This similarity shows that man, the only creature on earth that God wanted for Himself, cannot fully reveal himself otherwise than in sincere self-giving", in the opinion expressed by the Vatican. We can but agree with the above quote, provided that the giving of self finally ensures the welfare of others, too, and that of the future generations, or in other words continuity of progress.

4. DISASTER MANAGEMENT AND SOME ALARMING STATISTICAL QUANTIFICATION OF THE STRIKING PHENOMENA OF CLIMATE IMBALANCES

The new science of disaster management involves a number of structured and intensively phased information processes, from the planning of the activities previous to disasters, to forecasting them, from the preparation during, and especially after the disasters, to the prompt response, completed through repair activities and even reconstruction. This science, like the four elements capable, through their excess, of offering its subject, can be also defined as a multidisciplinary and multi-institutional approach, focusing on practical meteorological and hydrological forecasting, on evaluation of the risks of occurrence of the extreme events called extreme climate land disasters, but also on prior or early warning, evacuation and taking steps to mitigate economic and social damage, on the intervention materialized in the rescue missions, on restoring the normal situation, on the rehabilitating the infrastructure and services affected, on the implementation of plans and activities able to prepare the population for other similar events. Myths and legends, religions and religious practices were gradually turned into scientific pursuits and disciplines, from those benefiting

from a dominant character of theoretical generalization (as for instance in philosophy), to the predominantly practical ones (e.g. physics); all together they round the group of the information methods and tools necessary to make managerial decisions in the new managerial sciences in full expansion, such as is the case of terrestrial natural disaster management, with some of the main causes predominantly climate-induced. Natural disaster management requires a detailed presentation of the climate characteristics or variables, the statistics of the extreme and rare events, and evaluation of their economic and social impact. Management of natural disasters caused by weather or climate includes: management of the forecast of the disaster-generating weather events, assessing the risk of such events occurring in the various regions of the world, and the practice of disaster management, which should be prompt, but of the "post factum" type, or else done shortly after the extreme events happened. Placed interstitially, between economics, management, and the science of climate processes, this extended interdisciplinary study aims to provide the reader with a useful analysis for understanding extreme climate events, and a valuable set of tools meant to solve some of the associated contemporary issues, both economic, and especially ecological and related to environmental (ecosphere) protection. Over the past decades, there has been a noticeable increase in the number of disasters, and of people affected by those disasters.

Figure no. 1

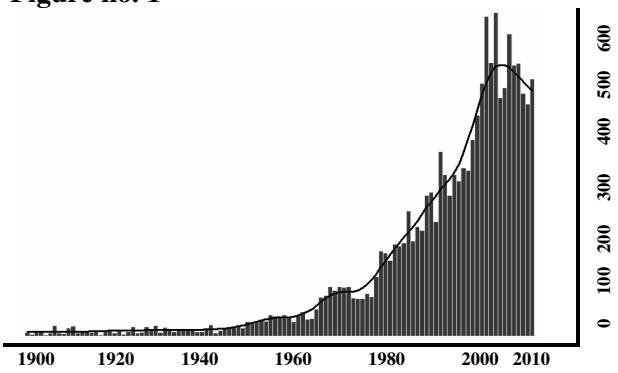
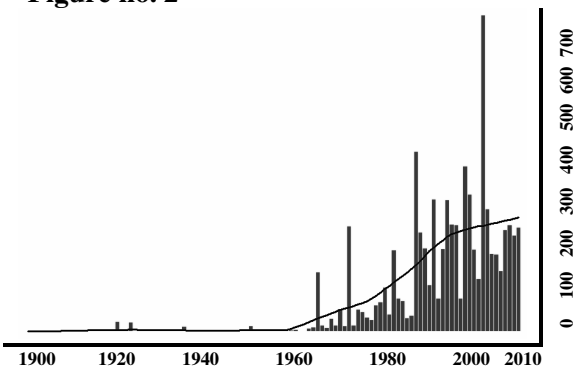


Figure no. 2



Source: EM-DAT:TheOFDA/CRED,International Disaster Database,www.em-dat.net,Université Catholique de Louvain, Brussels – Belgium şi http://unstats.un.org/unsd/ enviroment/qindicators

The number of reported natural disasters (fig. no. 1 - in cases), and the number of affected persons (fig. no. 2-in millions), between 1900 and 2010

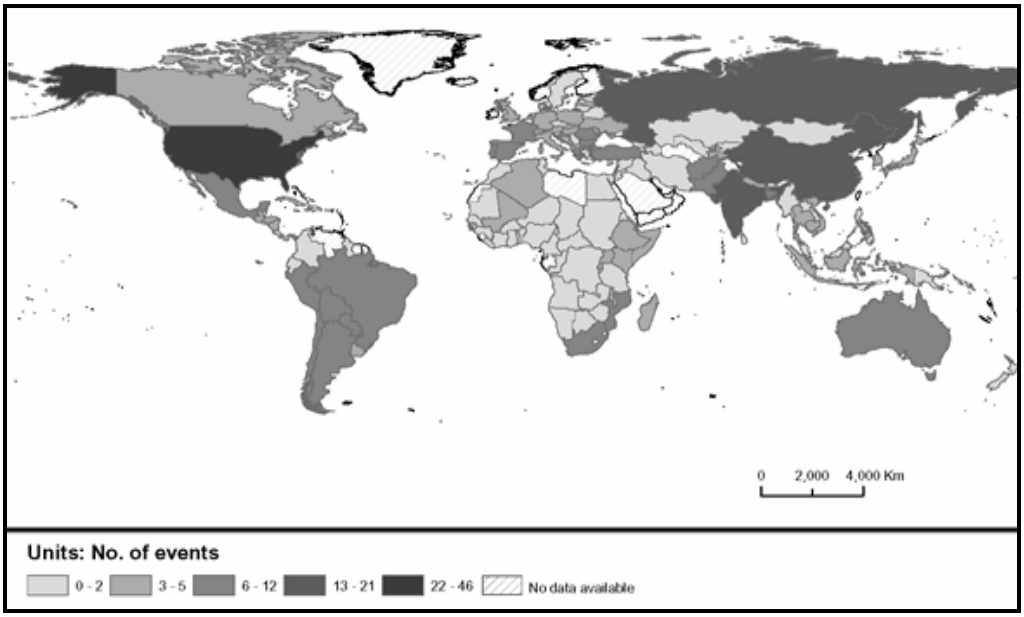
Over the last thirty years, mankind has been facing disasters on an unprecedented scale: an annual average of over ¼ million people worldwide have been affected by natural disasters, with an absolute magnitude ranging between 68 million, and more than 620 million inhabitants. Over the last ten years there have occurred, due to increased environment (ecosphere) imbalance, more and more disasters on the global level, while the area affected by an average ranging between 6 and 21 events dominates the continental areas.

During the same period, the disasters mentioned have caused an estimated average loss of 58,000 lives a year, with an absolute magnitude of between 10,000 and 123,000 inhabitants. The maximum value was reported during 2005, when about one in 25 inhabitants of the world was affected by natural disasters.

From an economic perspective, over the last three decades, disasters have caused annual losses estimated at an average of 65 billion dollars, placed between the maximum level of 230, and the minimum value of 28 billion dollars.

Since 1950 up to now, the estimated cost of natural disasters has increased almost 17 times, and there has been an overall accumulation of hard evidence highlighting the effects on the

natural environment of inappropriate human behaviour, but also the possibility for certain types of disasters, like flooding, to increase numerically, as a direct and immediate consequence of human activity.



Source: OFDA/CRED International Disaster Database (EM-DAT) http://unstats.un.org/unsd/enviroment/

Figure no. 3. The geographic areas and the intensity of climate disasters worldwide (2000 - 2010)

Anticipating, mitigating and preventing disasters that can befall vulnerable populations is getting a more and more distinct and extensive shape in the world of science. The economic and social impact and especially the environmental aspects of climatic disasters reveal a number of almost unimaginable consequences of such events, in keeping with the current trend. The statistics of the economic and social impact of climate disasters is characterized by a dynamism which is only comparable with the population explosion in the developing countries. Over the last two decades of the 20th century, more than three million people were killed by natural disasters around the world. Those disasters resulted in accidents and injuries, permanent loss of houses and dire poverty by another billion people, causing economic loss of thousands of billions of dollars. On average, each year, natural disasters throughout the world left some 4 million people homeless, brought about unexpected accidents and more or less serious injuries for another 900,000 people, and finally even killed over 128,000 people. Worldwide, in a single year, namely 2000, there were about 400 reported events like natural disasters, out of which 50 qualifying as major disasters, which required international aid. After the year 2000, the number of the events described approached 600 in some years. It was estimated that the global economy lost, due to natural disasters, more money than it was able to spend on the aid allotted to the development of poor countries, until 1992 (when the two figures were, respectively, 62 and 60 billion dollars). The specialized nature and the relative undersize of the economies of most poor countries, dramatically increases their vulnerability to natural disasters, as opposed to developed economies. Also, in most poor countries, disasters occur with greater regularity, also mainly due to the economy, namely the lack of funds required to implement specific lasting solutions of disaster management. The most notable social and economic consequences of natural disasters include the following broad categories: (a) loss of life / casualties; (b) panic, split and division, or social exclusion (as exemplified by the dissolution of the major senses of community, security and control); (c) increased probability for social unrest, and even violent conflict to occur; (d) destruction of

the foundation of the natural resources and the environment; (e) temporary loss of housing; (f) an increasing flow of temporary and / or permanent emigration, and a parallel decrease in, or disappearance of, immigration flow; (g) loss of manufacturing and/or farm production (with the associated implications for employment, the level of income and taxes); (h) damage to infrastructure (transport and communications systems); (i) disrupting, and even completely crippling, of the general economic and specific markets (from the local market to the regional or even national market, from the market of goods and services, to stock markets, etc.), and hence of distribution, amounting to commercial losses; (j) degradation of living conditions, both instantly and in the long or medium term, due to both the unexpected extreme events and the deferral or termination of programs development correlated with real social needs; (k) short-term reduction of the gross domestic product and the income per capita; (l) local, regional or national fiscal budget deficits, as a direct result of urgent reallocations of expenditure; (m) short- and medium-term inflationary pressure caused by market distortions and reconstruction costs, having as sources foreign loans. About one quarter of the world population lives in areas that are subject to a significant risk of occurrence of climate disasters. However, invariably the impact of disasters and, especially, the occurrence of side effects (whether they relate to loss of life or damage to, or destruction of property, to social unrest and economic disorders) is highest where those affected live in obvious concentrations of poor population. Increased vulnerability to natural disaster or exposure to climate disasters are another statistical facts. The social and economic cost of natural disasters due to climate is in a process of continuous expansion throughout the world. The trend is largely attributable to increasing vulnerability in less developed countries, especially in the poor nations, where the population remains, in most cases, more vulnerable to extreme climate events that occur later, after the people experienced a first severe disaster. Many other factors significantly contribute to augment vulnerability, of which a few can be mentioned: a) the demographic explosion, which results in both an increase in population density, and increased investments in urban periphery land (an example being the increased use of land previously considered unsuitable or unsafe), (b) practices opposed to sustainable development, especially those related to urban periphery land; (c) the inability of governments, faced with a rapidly growing population, to provide adequate social services, including services designed to mitigate the impact of disasters; d) degradation of natural resources (easy to illustrate by the transformation into grazing land, or deforestation of huge areas of land previously covered in forests); (e) the increased insecurity of stocks of food and water supplies; (f) rural-urban migration and the pressure of urbanization, leading to a concentration of population in some cities that are increasingly uncertain; (g) the increase in population living below the poverty line and in conditions of illiteracy, and implicitly in the number of those exposed to extreme climatic events; (h) the weak institutional capacity to cope with climate disasters; (i) the inadequate measures of disaster management and the often unsuitable forecasting techniques; (j) the inadequate involvement of local communities in disaster management; (k) inadequate training; (l) inadequate communications, and transport infrastructure inadequate for extreme events; (m) the lack of both measures and strict environmental control provisions; (n) inadequate market mechanisms meant to promptly create buffer zones against disasters and the risks of expansion; (o) increasing global interdependence of economies, leading to the expansion of the impact of single disasters, and (p) global climate change, which is increasing the vulnerability of certain geographic regions to extreme weather events. While some specific internal factors tend to increase society's vulnerability to disasters, still there arise trends of technology conducive to lowering it. Examples of such positive trends are: (a) constant scientific advances in the fields concerning themselves with the knowledge of the

processes and phenomena related to extreme or rare events, (b) improved analytical methods, which enable the development and continuous improvement of complex models, (c) expanding communication, which provides real-time adaptation conditions, brought about by the very modern way of understanding communication, and (d) the dynamics of the advanced technical experiments allowing a much improved understanding of the sensitivity of materials and structures, along with the development of new approaches in industrial and design areas. These developments are, however, a partial compensation of the increased confidence in technology, which still remains fragile and sensitive to the contact with extreme or rare events. However, if natural disasters are acknowledged social signification and economic costs, it becomes obvious that sustainable development can be significantly improved by reducing their impact, diminishing vulnerability as a component part of an overall disaster management strategy.

5. A STATISTICAL METHOD FOR SOCIAL COHESION'S EVALUATION AND THE IMPACT FOR HUMAN ECOLOGY

The 21st century has historically marked the setting up of a number of opposite continental trends, and also of a concept of demographic explosion, whose impact was unprecedented in previous centuries, an explosion that is mainly related to the lack of economic development of the countries and regions lying in the so-called Southern Pole, or the pole of world underdevelopment. At the turn of the 2lst century, but especially in this new century, the concept of demographic implosion, typical of developed countries no less than the nations in Eastern Europe, and also typical, though surprisingly, even of the countries in transition or convergence to the market economy model of the European Union, has become dominant in the Northern Pole, or the pole of economic overdevelopment.

Humanity is now in the midst of a set of demographic phenomena of major environmental impact, and the new dimensions of environmental protection (of resources), through the multiplication of the available resources, anticipate a change in the evolution of society comparable to the impact of quantum physics in understanding the evolution of the universe. In the last half of a century, numerous meanings and reinterpretations of the concept of development, welfare and environmental protection have been identified from the organic growth, to the era of wasting, which specifically have addressed specific issues like underdevelopment, the contradictions and huge gaps between rich and poor nations, especially focusing on the matter of equal opportunities and participation of the people in the development process. The contemporary language has stressed the importance of economic development, hence another term, apparently simple, which has become over the past decades rather dull and obsessive, namely *economic growth*. There is growth (relative, of course) if a statistical result of development, defined by GDP, compared with the previous level, gives a positive image, where there is a simple reduction, assimilated through the concept of rate of real gross domestic product: Rhythm $^{\text{real GDP}}$ (%) = Index $^{\text{real GDP}}$(%) - 100 (%) > 0. Without obscuring the significance of economy, or disavowing its specific language, it can be said that this quantitative growth, expresses rather few complex aspects of contemporary life, which is why it individualizes itself so distinctly, in an interdisciplinary manner, along three directions, through three other conceptualizations: *sustainable development* (a manner of re-defining development, which focused on the environment and expands the importance of natural environment or of the ecosphere seen as unchanged in a destructive direction and in an integrated system), *quality of life* (a subjective state of welfare, or a level of satisfaction and

fulfilment of people's lives as a result of economic, cultural, social and environmental conditions) and *social cohesion.*

Some definitions and the modern content of the social cohesion

Box no.2

Emile Durkheim was the first who investigated this multidisciplinary concept, anticipating two specific typologies: the *mechanical solidarity*, generated by the lack of social division of labour (to be found in villages, where all the members of the community are peasants), and *organic solidarity*, based on social division of labour, where the members of such communities need each other because each ones fulfils complementary functions. The definitions of social cohesion are increasingly diverse: it is variously viewed as a *continuous process of developing the values, challenges, equal opportunities in the community based on trust, hope and reciprocity among all Canadians*, or *as a set of social processes that inoculate the individuals with social sense of belonging to the same French community*, or as *a situation in which different groups and institutions unite to defy differences, building on individual opportunities, on education, jobs, health, parental responsibility and family welfare, on powerful, secure and supportive communities, on national identity, history, cultural heritage and civil rights, as in New Zealand*, or as *a link between communities, between people who coexist, interact and support one another by material means, sharing common beliefs, customs, habits or expectations, as in Australia*, or else as *access to the foundation of basic social relations, such as participation in work activities, family life, politics and civil society activities, as in Denmark. The objective of social cohesion in the European Union implies a reconciliation of the system of organization based on market forces, freedom of opportunities and entrepreneurship, with engaging the values of solidarity and mutual support, which ensure free access to the benefits and provides protection to all members of society*. The social cohesion becomes today a central pillar of European development policies (cf. the 1986 European Single Act, according to which economic and social cohesion in Europe must become a target, like the single market, being defined as a form of sustainable and balanced development, intended to secure the reduction of the structural disparities between the regions and countries, and to promote equal opportunities for all). Currently, social cohesion is identified as the concern for maintaining inclusion in a society which thus becomes able to withstand the external shocks and the cyclical effects of the tough world economy. The extended version of the scale and dimensions of social cohesion, in Paul Bernard's opinion, identifies the following aspects: economic (*Inclusion/Exclusion, by Equality/Inequality*), political (*Legitimacy/Illegitimacy, by Participation/Passiveness*), and social-cultural (*Recognition/Repellence, by Membership/Isolation*). Two major directions characterized the quantifying project through social cohesion ever since its inception: I) *reducing the regional and structural and disparities, as well as social exclusion* within society, which distinguishes the following aspects: a)*regional disparities*, b)*equal opportunities/discrimination against: gender groups, generations, social classes, the disabled, minority groups*, c) *social exclusion*; and II) *the strength of the society's social capital,* which is also extremely important, and within which the following elements can be identified as relevant: a) *availability of social relations*, b) *social and political activities and involvement*, c) *quality of social relations*, d) *quality of society's institutions*, and, additionally, e) *the specifically European concern with issues relating to social cohesion among European countries*. In its first version, the 2001 matrix of social cohesion indicators (EUSI), where the elements were grouped by domains, components, aspects and dimensions, identified and developed indicators for six critical areas: a) *population, households and families***;** *b) shelter and housing; c) education and training; d) labour market and working conditions; e) income, living standards and consumption patterns and f) health.* The Romanian approach to social cohesion has been achieved by attempting to decrease poverty, and, implicitly, social exclusion. In April 2001, the Anti-Poverty and Social Inclusion Commission (CASPIS) was set up by the Prime Minister's order, the role of which was to coordinate the anti-poverty measures. Finally, the Social Protection Committee has established a list of 18 indicators of social inclusion (10 primary and 8 secondary). The category of primary indicators includes: *the poverty rate (lying at a threshold of 60% from the median of incomes), in accordance with sex, age groups, by category of households, by type of household, by area of residence, the ratio between top and bottom quintile distribution of population by income, the persistent poverty rate, the median relative distance, the coefficient of variation of employment rates by region, the long-term unemployment rate, the proportion of the population in the households without employed persons, the proportion of young people aged 18-24 years who have left the education system early; life expectancy at birth, the ratio of the number of people in the lower and upper quintile who consider their health as bad or very bad*. The latter category, that of the secondary indicators, includes: *the poverty rate threshold of 40%,*

50% and 70% of the median income, the poverty rate at a time-anchored threshold (3 years), the poverty rate before the social transfers, the Gini coefficient, the persistence of poverty (compared with the 50% threshold), the share of the long-term unemployed in the total number of the unemployed, the very long-term unemployment rate, the proportion of people aged 16 and older having only a primary level of education, out of all the people aged 16 years and older.

The measuring pattern of social cohesion proposed and realised in this paper is focused on the assumption that social cohesion is determined and supported in a representative proportion by certain *equitable living conditions*, reflected in the existence of *minimum conditions for relating*, and *inclusion or the lack of exclusion*. The motivation is easy to perceive, meaning *meeting the basic needs (the existence of the minimum requirements for relating), which allows people to be willing to relate, while inclusion should materialize the relating*. In Romania, social cohesion can be estimated by monitoring elements that determine the willingness to cooperate, the feelings of trust and respect for diversity, the sense of belonging and the perceptions of the need for social-political participation and social support. A static model for social cohesion in our country, during Romania's admission period to EU, selects the following questions for the six highly typical dimensions:

Table no. 1 Elements of estimating social cohesion in Romania

Dimensions	**Questions**
Trust in people	*Do you think that one can trust most of the people?*
Trust in institutions	*How much do you trust the institution of the church, government, parliament, the judiciary, the army, the police, the city halls, the unions?*
Respect for diversity	*Do you try to convince your friends, relatives or colleagues to share the same opinion or idea you believe in?*
Belonging	*If you had the opportunity to choose the country for you to live, would you choose Romania?*
Participation	*Apart from weddings, funerals and baptisms, how often have you gone to church lately? To what extent do you think people like yourself can influence the decisions taken for your city (country)?*
Social support	*Do you have relations / acquaintances you can trust if it comes to one of the following: illness, consultation, treatment, intervention in the court, the notary, the lawyer, the mayor, the police, to obtain a credit, in getting a job, in the business world ?*

Source of questions: BOP, October 2005-2006, data being statistical aggregated using the specific method of evaluation for each dimension.

The model is based on an algorithm for estimating social cohesion, and the conclusion drawn after using several robust indicators was naturally a statistically acceptable one.

Table no. 2 Indicators of social cohesion in Romania

		Trust in people	Confidence in institutions	Respect for diversity	Belonging	Participation	Social support
1	Moldavia	27.49	42.44	49.74	75.65	20.83	8.75
2	Wallachia	36.81	39.61	47.25	84.35	16.23	10.89
3	Oltenia	26.70	42.13	49.21	78.53	14.41	12.45
4	Dobruja	31.25	51.10	50.00	87.50	25.66	10.72
5	Transylvania	36.08	38.36	58.24	67.05	19.45	14.33
6	Crishana-Maramuresh	23.78	43.22	59.76	69.51	16.15	21.59

7	Banat	15.12	38.22	60.47	51.16	19.14	13.23
8	Bucharest	41.50	35.89	67.50	77.00	24.77	16.34
Romania		**31.67**	**40.60**	**54.28**	**74.89**	**19.14**	**12.96**

In order to collate and rank the regions, checklists were used, containing eight value ranks, the length of each rank being given by the ratio of the amplitude of the series (consisting of cohesion values for each region), and the number of ranks. The final results were as follows:

Table no. 3 Social cohesion indicators expressed by statistical indices

		Indicator of social cohesion (I_{cs})	*Score*
1	Moldavia	41.59	4
2	Wallachia	43.41	5
3	Oltenia	41.69	4
4	Dobruja	47.06	8
5	Transylvania	42.60	5
6	Crishana-Maramuresh	43.35	5
7	Banat	36.71	1
8	Bucharest	47.99	8
Romania		**43.03**	**5**

Both regionally and nationally, there was a weak social cohesion, the indicator value failing to exceed 50%, which shows that one in two people have an attitude of deterring exclusion.

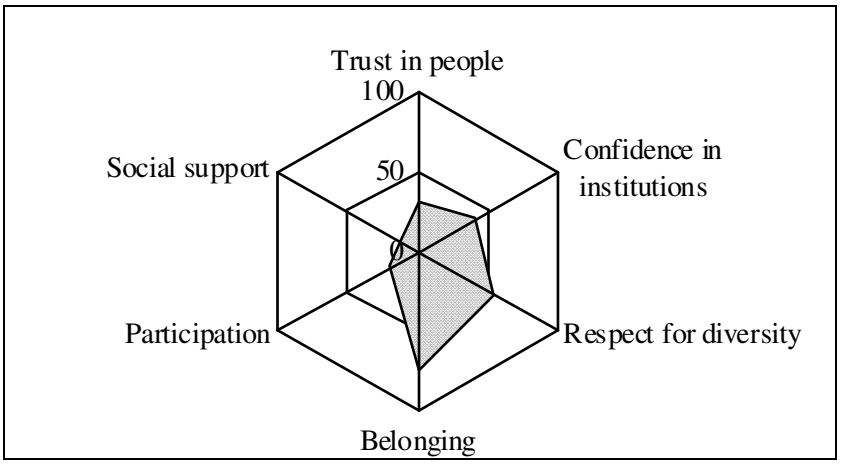


Figure no. 4. National dimensions of social cohesion

The graph emphasizes that there are significant differences between regional parts of a national territory, and the low level of cohesion is generated mainly by the very small amounts of *social support and participation*, and also of those of *trust in people* and *confidence in institutions*. The national value of 50% was exceeded only for the dimensions of *belonging* and *respect for diversity*, which, although having higher percentages, have not cancelled the negative effect of the other dimensions. The most cohesive historical regions are Bucharest (due to *respect for diversity*) and Dobruja (due to *belonging*), while the diametrical opposite is Banat (actually, because of weak identification with the national *holos* or social and cultural model). Moldavia and Wallachia are placed below the national average value. The impact of social cohesion for human ecology is enormous, because it offers information about how to change the current angle on isolation by which the world's poor are rather a problem than some potential productive and creative actors in society, detailing many crucial

aspects for creating new employment opportunities, education, basic health care, or adequate housing conditions, new respect, trust and confidence.

6. SOME FINAL REMARKS

Globalization as a whole process, the extended transitions of outdated technologies, industry the cyclical nature of industry, and the rapid depletion of resources have almost completely changed the environment, population and the ecosphere in general, over the last decades. The measurement of social cohesion underlines the connections between traditional aspects of all regional areas and the necessity of national politics for human ecology, in a global plan including management disaster and social cohesion. Different parts on the same country's map offer different aspects and specific mitigation and intervention activities for the contemporary disaster management and human cohesion. There are undoubtedly more global than national or local alternatives to stop the transformation of our planetary environment, in the current accelerated destructive manner, which can forever change, and even destroy, the nations' and people's lives and prospects, irrespective of their being at the Southern, or Northern Pole of development. To see that, the clearest pieces of evidence that can be envisaged are the fact that humanity has evolved, and it is not only its technologies that have multiplied, but also its values and beliefs, throughout its turbulent and oscillating history, and there is no reason why it should be unable to resume its natural links with the natural environment (the ecosphere), in a creative way, in the next few generations. The time is indeed crucial, as humanity must, from now on, most carefully consider his own demographic chart as well, to identify a path of sustainable development and human cohesion for the future. The *new consciousness of Holos* will have to force the people to behave in their private sphere according to Confucius' principle of reciprocity: "*Treat others as you would like to be treated yourself*", metamorphosed by Mahatma Gandhi, two and a half millennia later, in the following wording: "*Be the change you want to see in the world.*" They were both right: if one develops one's conscience, one has the power to change the world, and therefore, the main priority of humanity remains the same, to do everything we can to activate and initiate the advanced, imminent consciousness, manifesting itself quickly in people's lives on a planetary scale …

6. REFERENCES

1. Alexander, D., 2002,*Principles of Emergency planning and Management*, Harpended:Terra publishing
2. Confucius, 1993, *The Analects*. Edited by Dawson, R. Oxford: Oxford University Press.
3. Eliade, Mircea, 1980, De la Zalmoxis la Genghis Han. Bucharest: Editura Ştiinţifică şi Enciclopedică.
4. Eliade, Mircea and Apostolos-Cappadona, Diane. 1985, Symbolism, the sacred, and the arts. New York : Diane Apostolos-Cappadona Crossroad.
5. Goswami, Amit, Chopra, Deepak, 2000, The Visionary Window:A Quantum Physicist's Guide to Enlightenment. London:Quest Books, Hampton Roads, Publishing,.

6. Guha-Sapir, D. Hargitt D., and Hoyois P., 2004, Thirty years of natural disasters: the numbers, Presses universitaires de Louvain, Brussels.
7. Laszlo, Ervi, 2006, The Chaos Point, Hampton: Hampton Roads Publishing Company Inc., USA and Piatkus, London.
8. Morris, Henry Madison, 2002, The Biblical Basis for Modern Science. Arkansas: Master Books, Green Forest, pp. 131, 234-250, 261-264, 270 and 284-286.
9. Isaic-Maniu, Al. (coord), 2003, Dicţionar de statistică generală, Ed.Economică, Bucureşti
10. Iwan, W.D, et al. 1998, Mitigation Emerges as Major Strategy for Reducing Losses Caused by Natural Disasters, Science Vol 284, pp. 1947 – 1963.
11. Jostein, Gaarder, 2006, Lumea Sofiei, Ed. Univers, Colecţia Cotidianul, pp. 36-40.
12. Kernbach, Victor, 1983, Dicţionar de mitologie generală,Ed. Albatros, pp. 30-31, 54-58, 219-224 and 545-548.
13. Penrose, Roger,1989, The Emperor's New Mind, Concerning computers, Minds, and the Law of Physics. Oxford; New York: Oxford, University Press,.
14. Săvoiu, Gheorghe, Iorga-Simăn, Ion, 2008, *Mitologie şi religie, fizica pământului şi filosofie în variaţia climei şi prezenţa dezastrelor climatice terestre, Progrese in teoria deciziilor economice in condiţii de risc şi incertidine.Ed. Performantica, Iaşi, vol V,* (2008): *pp. 212-218*
15. Săvoiu Gheorghe, Cristea Alina, 2005, *Coeziunea socială-concept şi măsurare*, Ed. Universitară, Bucureşti.
16. Săvoiu, Gheorghe, 2008, *Adaptive Management of Global Climate Problem:Bridging the Gap Between Climate Research & Climate Policy,* Annals of Oradea University. Fascicle of Management and Technological Engineering, Vol. XVII (VII)
17. Săvoiu Gheorghe, 2010, *Gândirea statistică aplicată*, Editura Universitară, Bucureşti
18. Spignesi, S. J., 2005, *The 100 greatest disasters of all time* (*100 cele mai mari dezastre din toate timpurile*), Ed.Lider, Editura cartea pentru toţi, Bucureşti.
19. Wisner, B., P. Blaikie, T. Cannon, and I. Davis, 2004, *At Risk - Natural hazards, people's vulnerability and disasters*, Wiltshire: Routledge.

WEBOGRAPHY

1. *http://www.em-dat.net EM-DAT:TheOFDA/CRED,International Disaster Database.*
2. *http://unstats.un.org/unsd/ enviroment/indicators Université Catholique de Louvain, Brussels Belgium*
3. *http://www.oecd.org/dataoecd/25/2 Social cohesion, public policy and economic growth: Implications for OECD countries,Ritzen J,/*1825690.pdf
4. http://www.biodiv.org/doc/publications/guide.asp.
5. http://www.redlist.org/info/categories_criteria