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In co-operation with
SEM Institute for Climate Change, Korte, Slovenia

The book in Slovenian and English on:
Knjiga v slovenščini in angleščini o:

The Three Applications of the System Thinking:
The Environment Theory of the Nature, The Information Theory
of the Nature, and The Climate Change System Introduction

Tri aplikacije systemskega razmišljanja:
okoljska teorija narave, informacijska teorija narave in
uvod v sistem klimatskih sprememb

Zg. Medoši, Korte, Slovenija/Slovenia

December/december 2009

Prof. Dr. Dr. h. c. Timi Ećimović

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The book is dedicated to The Nobel Foundation on accassion of my the third nomination.

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1. Predgovor

Po 26 letih raziskav zaključujem delo na področju filozofije narave. Želim spodbuditi znanost, da prevzame družbeno odgovornost za našo civilizacijo.

Dvotirnost človeške družbe in narave je fascinantna. Nista si podobni in še manj harmonični.

Na srečo ali nesrečo si je človeštvo določilo mesto edinega gospodarja planeta Zemlja in se ob tem niti ne zaveda, da je v resnici gospodar vsega človeštva monstrozen vladar »denar«. Ta ni potreboval revolucije za prevzem vladavine. V praksi si je podredil tako dobre, kot slabe ljudi. S tranzicijo finančne dejavnosti v industrijsko proizvodnjo denarja brez podlage je omogočil dodatno spremembo družbe na privilegirane in ostale. Celo politiki so zamudili tranzicijo in so se našli v situaciji brez izhoda. Totalno razvrednotenje denarja po vrednosti in izhodiščnih podlagah je omogočilo nerazumno visoke dohodke finančnikom, upraviteljem, športnikom, politikom, kriminalnim združbam, zabaviščnikom in birokraciji. Edino merilo uspeha je količina denarja.

Poleg denarja je razvrednoteno tudi delo in temu primerno vsa družba. Kvaliteta je izgubljena na račun kvantitete. Tretji list deteljice zaključuje odgovornost, tako družbena odgovornost korporacij, kakor tudi družbena odgovornost posameznika.

Krizi družbe sledi kriza znanosti. Ni več pomembno, kaj znaš, ampak kako in koga poznaš. Znanstveniki delajo za denar in gospodarje družbe. Opravljajo delo, ki jim ga ti narekujejo. Znanosti delijo denar politika, vojaška industrija in administracija. Najboljše univerze niso najboljše zaradi kvalitete, ampak zaradi količine denarja, ki se pretaka po poteh univerzitetne birokracije.

Mislim, da potrebujemo prenovno izhodišče medsebojnega spoštovanja. Spoštovanja vrednot človeka in človeštva ter zavračanje vrednot, ki so nas pripeljale tako daleč, da ne spoštujemo narave lastnega okolja v katerem živimo.

Upam, da je še čas, da se prebudimo iz lagodja, ki si ga domišljamo, ki pa ga v resnici ni.

Prof. dr. Timi Ećimović



2. Povzetek

Vizija trajnostne sonaravne prihodnosti človeštva ima čarobno moč, saj predstavlja samo naravo in človeka ne kot posameznika ampak daje odgovor na to kako smo prišli do danes, kdo smo danes in kaj bomo v prihodnje, če!

Okoljska teorija narave odpira nove meje spoznavanja sedanjosti in narave.

Informacijska teorija narave omogoča spoznavanje sistemov, procesov in vzrokov za to kar smo.

Pojem sistem ima veliko vsebin. Tukaj ne bo pomenil niti miselne slike o obravnavanem pojavu ali procesu niti običajne metode dela niti družbeno-gospodarske ali kakšne druge trajne ureditve niti spleta rastlin ali kamenin ali ljudi, ki nekako spadajo skupaj, ampak pojav, ki je tako zapleten po svojih sestavinah, povezavah in vplivih med njimi ter posledicah, da ga je težko povsem dojeti in še težje obvladati¹.

Zato govorimo o sistemu klimatskih/podnebnih sprememb.

Ne pomaga nam veliko, če ga dojamemo in/ali obvladamo po delih, saj ima kot celota bistveno drugačne lastnosti, kot jih imajo deli vsak zase.

Resnico bomo lažje spoznali in težave ter razvoj lažje obvladali, če obravnavamo pojav čim bolj celovito namesto po posamičnih delih. Pogoji za to je čim bolj celovito obnašanje ljudi, t.j. opazovanje, dojetje, razmišljanje, čustveno in duhovno življenje, odločanje in uresničevanje odločitev, iz česar izidejo čim bolj celovita spoznanja in drugi izidi. Temu rečemo sistemski pristop.

Popolne celovitosti običajno nismo sposobni doseči, ena sama specializacija – en sam poklic ali en sam vidik – pa nas omejuje na navidezno celovitost. Zato upoštevamo Mulej/Kajzerjeva (1998) zakon zadostne in potrebne, t.j. primerne celovitosti.

Klimatske/podnebnne spremembe z učinki globalnega segrevanja, nenadnih naravnih katastrof od cunamijev, poplav, viharov, sušnih obdobij do sprememb v klimi/podnebnju v lokalnih območjih, kjer ljudje živijo v lokalnih skupnostih, so danes najpomembnejša sprememba v biosferi planeta Zemlje. Ogrožajo današnjo svetovno človeško skupnost.

Sistemski pristop k raziskovanju klimatskih/podnebnih sprememb mora zato v sinergiji upoštevati marsikaj, kar kažejo sodobna znanost, obdobje globalizacije - ki prihaja, sedanja razvitost človeškega družbenega sistema, življenje v velikih mestih, ki se po vsebini močno oddaljuje od narave, upravljanje tehnologij brez trajnostne ali sonaravne vsebine, pomanjkanje družbene odgovornosti² posameznikov in gospodarskih subjektov,

¹ Po učenju zaslužnega prof. dr. Matjaža Muleja, Univerza v Mariboru.

² Družbena odgovornost je lastnost ljudi in njihovih organizacij. Preprečuje ali vsaj lajša nevarnost, da bi ljudje zlorabili svoj vpliv in s tem škodovali sodelavcem, drugim poslovnim ali osebnim partnerjem, širši družbi ali naravi, od katere sta odvisna obstoj ali vsaj kakovost življenja ljudi. Taka je kratko povzeta opredelitev v mednarodnih uradnih dokumentih. Po drugih virih gre za nadgradnjo truda za inoviranje pod imenom izboljševanja in doseganja popolne kakovosti ali odličnosti. Tretji viri jo tesno povezujejo s celovitim obnašanjem, četrti pa tudi s trdom za mir



nekontrolirana eksplozija reprodukcije človeštva, poznavanje kratkoročnih in od časa do časa mogoče srednjeročno ali celo dolgoročno škodljivih učinkov sintetičnih kemičnih izdelkov, modernih tehnologij, vojaških tehnologij, eksplozijskih motorjev, transportnega sistema, nuklearnih tehnologij, industrije in kmetijstva, lokalne, nacionalne in mednarodne razdelitve politične in administrativne oblasti in njihovo delovanje na usmerjanje dela znanstvenikov ter posledičnega usmerjanja razvoja znanosti; vse to namreč povzroča čedalje večji razmak med življenjem ljudi in človeškimi globalnimi, nacionalnimi ter lokalnimi skupnostmi in naravo planeta Zemlja.

Ta razmak grozi, da bo sedanja človeška civilizacija propadla.

V zadnjih letih vidimo v jeziku politikov in birokratov čedalje večjo manipulacijo pojmovnih in vsebinskih pomenov klimatskih/podnebnih sprememb, globalnega segrevanja, a jih uporabljajo sicer z veliko samozavestjo, vendar brez pravega poznavanja resničnosti sistema klimatskih/podnebnih sprememb.

Trajnostna/sonaravna prihodnost človeštva ali harmonija človeškega sistema s sistemom narave/biosfere (Ećimović 2005; Ećimović Mulej, Mayur 2002; Božičnik, Ećimović, Mulej 2008) ni možna brez ustvarjalnega sodelovanja vseh ljudi za sinergijo – primerno celovitost.

Zato je pomembno predstaviti sistem klimatskih/podnebnih sprememb tako, da ga razume navadni človek, ki naj bi aktivno sodeloval pri procesih, delu, ukrepih, vsebinah in spremembah v življenjskih navadah ljudi, ki so potrebne za trajnostno/sonaravno prihodnost človeštva.

Še bolj je pomembno, da sistem klimatskih/podnebnih sprememb razumejo politiki in administracija/birokrati, ki krojijo svojo prihodnost in tako tudi prihodnost nas vseh pripadnikov človeštva na Zemlji.

Namen mi je, da predstavim sodobni pogled znanosti na naravo in sistem klimatskih/podnebnih sprememb v slovenščini in v angleščini kot jeziku širokega spektra govorečih ljudi na svetu; v drugih izvedbah tega zapisa pa tudi v mnogih drugih jezikih.

Predstavitve v posameznih jezikih niso prevodi, ampak izvirni prispevki z zelo podobno vsebino.

Upam, da bo ta prispevek doprinesel k možnosti sonaravne/trajnostne prihodnosti našega območja, območja naše države in vsega globalnega človeškega sistema. Trajnostna/sonaravna prihodnost lokalne skupnosti je pot do globalne sonaravne/trajnostne prihodnosti človeštva (Ećimović 1989).

Upam, da bomo odgovorili na izzive sedanjosti in prosim, da me obvestite, če niste zadovoljni s to predstavitvijo. Saj tako lažje dosežemo napredek v medsebojnem sporazumevanju.

na svetu (Hrast idr., 2006, 2007, 2008, itd.). Sedanje nevarno stanje klimatskih/podnebnih sprememb je v bistveni meri (draga!) posledica premalo odgovornega obnašanja ljudi v stoletjih industrializacije in tudi danes. Družbeno odgovorno obnašanje stane manj od družbene neodgovornosti vsaj na daljši rok in ob manj ozkem pogledu na lastno korist ljudi in njihovih pripomočkov, imenovanih podjetja in/ali druge organizacije, lokalne in globalne.



3. Okoljska teorija narave

»Okoljska teorija narave« je napisana za Nobelov sklad³ kot informacija o naravi.

Povzetek:

»Okoljska teorija narave« je filozofija narave, ali z drugimi besedami, je iskanje spoznanj in znanstveno raziskovalnih osnov o naravi, ki pomenijo spoznavanje življenja in veselja.

Besedi "okolje ali prostor" imata več različnih razlag in mislim, da je potrebno definirati in klasificirati te različne pomene. V mojih raziskavah narave ima beseda okolje velik pomen in sicer bolj pomeni razumevanje filozofije narave kot kar koli drugega.

Ključne besede:

Evolucija, filozofija, informacija, inovacija in inovativnost, narava, okolje, sistemsko razmišljanje, zgodovina

Uvod:

Sedanje stanje biosfere planeta Zemlja, življenjskih pogojev, dnevnega dogajanja in življenja ljudi globalne človeške skupnosti ter ostalih živih bitij nakazuje znake stresa, ki je posledica njihovih naporov za prilagajanja na nove in spreminjajoče se življenjske pogoje v biosferi Zemlje, ki so posledica delovanja sistema klimatskih sprememb.

Po šestdesetih letih 20. stoletja spremenjeni pogoji življenja v biosferi Zemlje postajajo bolj opazni, kot če bi bile to samo ciklične spremembe v sončnem in zemeljskem sistemu. Večinoma so to spremembe v vremenskih vzorcih. Najbolj pomembna je sprememba v ozonskem zaščitnem plašču, ki pod vplivom delovanja prostih klorovih ionov prihaja v stanje zmanjševanja zaščitnega delovanja. To je posledica sproščanja klorovih ionov iz klor-fluorovodikov (CFC-jev), inoviranih in komercialno uporabljenih v naši družbi s samo enim osnovnim ciljem POVEČATI PRIDELAVO DENARJA ZA LASTNIKE KAPITALA. Torej CFC-je smo ljudje izdelali in jih z uporabo sprostili v biosfero ter si tako začeli rezati vejo, na kateri sedimo/živimo.

S prihodom tretjega tisočletja klimatske spremembe postajajo pomembnejše. Svet politike in znanosti se začena deliti na dve vidni frakciji:

- prvi zagovarjajo teorijo odgovornosti ljudi za te spremembe in imajo najmočnejše zagovornike med Mednarodnim panelom za klimatske spremembe, Združenimi narodi in nacionalnimi političnimi elitami razvitih ter manj razvitih dežel sveta. Tako so si naredili pomen uradne verzije klimatskih sprememb, ki jo s pridom uporabljajo za dodatno zbiranje denarja, s katerim pokrivajo samo svoje potrebe. Plačniki pa so seveda vsi ljudje.

³ Poštni naslov; The Nobel Foundation, P. O. Box 5232, SE – 102 45 Stockholm, Sweden, cesta: Storegatan 14, Stockholm



- med drugimi, ki zagovarjajo vzroke klimatskih sprememb kot naravne pojave cikličnega izvora zaradi delovanja sonca in zemlje, se nahajajo znana imena znanosti in družbe. To je veliko manjša skupina znanstvenikov in modrecev.

Obe skupini osredotočata moči na ugotavljanje stanja in medsebojno kritiko. Pozitivnih rezultatov NI. Edini uspeh so priprava, podpis in uresničevanje Montrealskih protokolov, ki zmanjšujejo proizvodnjo in uporabo CFC-jev. Če človeštvo ne bi zavrlo uporabe CFC-jev, bi imeli veliko slabše življenjske pogoje od sedanjih.

Ob koncu 20. stoletja in v začetku tretjega milenija sem samostojno deloval, kot raziskovalec, vendar v sodelovanju s številnimi strokovnjaki iz vseh delov človeške globalne družbe. Zbiram podatke o delovanju klimatskih sprememb, spremljam znanstveno delo in družbena gibanja v povezavi s spremembami globalne družbe. Moje osnovno znanstveno orodje je sistemska teorija, sistemsko razmišljanje, analiza in sinteza ter podatki. Po 20 letih znanstveno raziskovalnega dela sem v sodelovanju z danes že pokojnim prof. dr. Rashmijem Mayurjem, in zaslužnim prof. dr. Matjažem Mulejem iz Univerze v Mariboru ter soavtorji objavil rezultate naših raziskav v knjigi »System Thinking and Climate Change System (Against a big »Tragedy of the Commons« of all of us)«. Na žalost je knjiga samo v angleškem jeziku, mehke platnice, 303 strani papirne verzije ter digitalna oblika (CD), ISBN 961-236-380-3 2002. To je bila naša prva knjiga z vsebino o sistemski strukturi narave, sistemu klimatskih sprememb in vplivih na človeško lokalno in globalno skupnost. Pred tem smo imeli na te teme številne prezentacije po vsem svetu, večinoma na znanstvenih konferencah.

Sledili sta informacijska teorija narave leta 2006 in okoljska teorija narave leta 2009. Te tri aplikacije sistemske teorije v mojih raziskavah so bile osnova za moje nominacije za Nobelove nagrade. Prvič sem bil nominiran iz fizike leta 2003 (sistem klimatskih sprememb), drugič leta 2007 (informacijska teorija narave) in tretjič leta 2009 za Nobelovo nagrado za leto 2010 (okoljska teorija narave).

Diskusija:

V mojih raziskavah ima filozofija pomen iskanja znanja in razumevanja narave, vesolja in življenja. Menim, da je okoljska teorija narave začetek iskanja osnov narave, ki se začne z okoljem v smislu *»osnovnega okolja narave«*. *To vesolje ali kozmos je izhodišče obstoja narave,*

Predstavil bi rad dve opazovani raziskavi in sicer: *teorijo okolja narave in informacijsko teorijo narave.*

Lokalne ali krajevne skupnosti, ki so ena od osnovnih oblik življenja ljudi, predstavljajo nešteto oblik individualnih življenjskih vsebin in načinov življenja posameznikov ter družin. Večina vsebin izhaja iz porekla ljudi, ki živijo v krajevni skupnosti. Ostala določila so značilnosti narave in okolja, znotraj katerih se nahaja krajevna skupnost. Tem sledijo geografske, biološke, fizične, kemijske in zgodovinske vsebine, značilne za krajevno skupnost. Skupne vsebine in družba so določene z dogodki, ki si sledijo dan za dnem, in življenjem ljudi v krajevni skupnosti. Vsi mi živimo v krajevni skupnosti, vendar zelo malo razumemo individualnost te. Nepregledna množica krajevnih skupnosti na Zemlji predstavlja nešteto množico individualnih oblik skupnega



življenja ljudi. Poleg družine v ožjem in širšem pomenu je krajevna skupnost še edina značilnost sedanjega življenja ljudi v biosferi Zemlje.

Ni težko opaziti podobnosti med zvezdami, planeti, galaksijami in ostalimi oblikami energije in materije v naravi z zgoraj opisanimi oblikami življenja ljudi in vesoljem. Tako kot redko razumemo individualnost krajevnih skupnosti, tako še manj lahko ali sploh ne razumemo individualnosti energije in materije, galaksij, zvezd in njihovih planetov, planeta Zemlja ter samega vesolja. Razumevanje otežkoča nepreštevna množica planetov v soseščini zvezdnega sistema Sonca v naši galaksiji. Da je dojemanje še težje, doprinese še bolj nepreštevno število galaksij, zvezd in planetov ter energije in materije celotnega vesolja. Da to še bolj zapletemo, naj dodam, da je to, kar mi razumemo kot VESOLJE, samo zelo majhen delček Vesolja.

Narava, poreklo Sonca in Zemlje, življenja na Zemlji ter nas samih LJUDI predstavlja delček skupne celote, ki jo imenujemo NARAVA. Mislim, da ni mogoče odgovoriti na vsa vprašanja o naravi. Toda ravno tako mislim, da na nekatera vprašanja moramo poiskati odgovore za dobrobit filozofije in razumevanja življenja ter celotnega okolja, v katerem se nahajamo. Sedanja znanost potrebuje evolutivni razvoj, da bi imela možnost odgovoriti na številna vprašanja o naravi. Zaradi tega sem v to predstavitev svojih raziskav vključil teorijo okolja narave, informacijsko teorijo narave in sistem klimatskih sprememb. Postali naj bi del osnov za napredek filozofije in znanosti v prihodnje. Moj končni cilj je trajnostna sonaravna prihodnost naših zanamcev.

Informacijska teorija narave je bila objavljena v moji knjigi »The Information Theory of the Nature, and« v letu 2006, mehke platnice, 208 strani papirne verzije knjige ter digitalna oblika (CD), ISBN 961-91826-1-8. Sedaj bi rad predstavil moje, pred kratkim zaključene raziskave okoljske teorije narave, ki odpirajo nove horizonte za raziskave in razumevanje filozofije in znanja o naravi. V resnici je to teorija, ki postavlja okolje kot osnovo narave oziroma njenega obstoja in tako odpira možnosti za nove raziskave ter spoznanja o naravi.

Okoljska teorija narave postavlja okolje kot predpogoj ali osnovo za obstoj česarkoli. »Osnovno okolje« narave je vesolje ali kozmos. Narava obstaja znotraj osnovnega okolja v neštetih oblikah, dimenzijah in vsebinah celotne energije, materije, informacij, sil, svetlobnih in drugih žarkov, atomov in delcev materije ter ostalih še nepoznanih vsebinah narave. Medsebojna odvisnost, medsebojno delovanje in sodelovanje vseh teh je narava. Začetek ali konec osnovnega okolja ne obstaja, temveč je ***»trajnostno nadaljevanje«*** narave vzrok vseh dogodkov, sprememb, transformacij in tranzicij, vseh vsebin narave. Osnovno okolje narave (vesolja ali kozmosa) je potrebno korektno definirati. Iz systemskega razmišljanja izhaja del tega, kar določa trajnostno nadaljevanje kot osnovo obstoja naravnega okolja in narave same, torej nima začetka ali konca, temveč je v ospredju trajnostno nadaljevanje narave.

Sedanje zmožnosti ljudi, filozofije in znanja ne omogočajo enostavnega razumevanja razsežnosti osnovnega okolja narave vesolja ali kozmosa. Sedanje znanstvene metode in tehnike ne omogočajo ugotavljanja razsežnosti vesolja. Imamo pa znanje in tehniko, ki nam omogoča formalno in ne vsebinsko definiranje soseščine Zemlje, Sonca, naše galaksije in vesoljske soseščine. Naše zmogljivosti so limitirane s tehniko in metodami raziskav.

Za razumevanje dimenzionalnosti vesolja in narave imamo tudi limitirane možnosti sedanjega znanstvenega jezika matematike, ki naj bi doživel prenovu, potrebno za raziskave v prihodnosti. Zelo uspešno smo spoznali veliki pok, črne luknje, vidno in nevidno materijo, teorije strun in druge briljantne dosežke vrhunskih raziskovalcev do sedaj, vendar nam ni bilo dano narediti prave definicije osnovnega okolja narave – vesolja ali kozmosa.



S postavitevijo »trajnostnega nadaljevanja« v osrčje znanja o naravi se odpirajo nove možnosti za spoznavanje filozofije in resnice.

Tako imamo sedaj osnovno okolje in trajnostno nadaljevanje, imamo medsebojno odvisnost, medsebojno delovanje in sodelovanje vse energije, materije, informacij, dimenzij, svetlobe in drugih žarkov, sil, delcev in še nepoznanih vsebin narave. Mislim, da sedaj rabimo definicije oziroma odgovore na nekatera vprašanja, kot jih recimo povzema informacijska teorija narave.

Sedanje razumevanje narave je posledica evolucije človeštva in je staro, kot je staro človeštvo okrog 200.000 let. Prej sem omenil knjigo o informacijski teoriji narave in mislim, da sem razumljivo podal okoljsko teorijo narave.

Novela raziskav ob informacijski teoriji narave je bila raziskava besede in pomena informacije. Sistemsko razmišljanje, filozofija in znanje nam omogočajo predstavitev informacije kot sistema/spleta lastnosti, količin, kvalitete, odnosov, navodil in še česa: vse energije, materije, svetlobe in ostalih žarkov, sil, delcev in dimenzij ter še nepoznanih vsebin narave pod predpostavko medsebojnih odvisnosti, medsebojnih delovanj in sodelovanja. Vse to skupaj je narava.

Mislim, da se ob pretvorbi materije in energije istočasno oblikuje tudi osnovna informacija, ki se preoblikuje simultano ter glede na novo nastale vsebine večinoma iz okolja, v katerem se pretvorba dogaja.

Nova informacija materije ali energije je podobna genetskemu kodu v »živi naravi«, je definicija kvalitete, kvantitete, možnosti in sposobnosti nadaljnjega sodelovanja, delovanja in odvisnosti ter evolucije. Nova informacija nastaja simultano ob pretvorbi, ki se v razmerah sistema ozadja narave lahko razume kot stalno spreminjajoča se skladno s spremembami vsebine in okolja. Tako je omogočena osnovna funkcija narave - trajnostno nadaljevanje. S trajnostnim nadaljevanjem se dograjujejo vsebine in kvalitete narave.

Pomembno je sistemsko ozadje, sistemske/celostne vsebine narave. Narava kot najbolj sestavljen/zapleten sistem/celota sploh, je sistem, ki naj bi ga razumeli kot sestavljeno vsebino in ne kot mentalno sliko v možganih živih bitij. To je še bolj pomembno, kadar razmišljamo o resničnem poteku dogodkov ali operacijskih lastnostih sistema. V tem se namreč nahaja osnova znanja o sistemskih vsebinah. Tako prihaja v ospredje delovanja sistema njegova stabilnost. Vsekakor je za stabilnost sistema potrebna stabilnost vseh podsistemov znotraj opazovanega sistema/celote/enote ter stabilnost odnosov opazovanega sistema znotraj in z zunanjimi oziroma eksternimi sistemi.

Kadarkoli se katerikoli interni podsistem premakne, pride do spremembe delovanja celotnega sistema. Poleg tega se pri spremembah eksternih sistemov ravno tako izgubi stabilnost opazovanega sistema.

Za moja razmišljanja je bila pomembna ugotovitev, da se takrat, kadar opazovani sistem izgubi stabilnost, dogajajo nepredvidljive vsebine. Tako ni mogoče predvideti, v katero smer se bo podal sistem, ki je iz kateregakoli vzroka izgubil stabilnost.



Na primer: po velikem poku (Hawking), ki je bil dogodek, ki je povzročil oblikovanje našega dela vesolja, je prišlo do velikega preoblikovanja energije in materije. Tako so nastale zvezde in galaksije ter naša zvezda Sonce. Sonce je evoluiralo planete in ostale dele sončevega sistema.

Istočasno s preoblikovanjem se je simultano preoblikovala in nastajala informacija, ki omogoča sistemsko trajnostno nadaljevanje celotnega ali posameznih delov sistema in tako naprej. Mislim, da se informacija preoblikuje glede na značilnosti okolja, v katerem se dogaja preoblikovanje, ter značilnostih udeleženih vsebin. Ob tem se tudi okoljske značilnosti spreminjajo.

Končno: pred kakimi 4.560.000.000 leti je zvezda Sonce oblikovala svoj planetni sistem in naš planet Zemljo. Na ta način ima vsak del »velikega« sistema zvezde Sonce svojo informacijo, ki omogoča trajnostno nadaljevanje. Mislim, da imamo na ta način nove možnosti raziskav o vsebini narave.

Z namenom, da bi lahko pripeljal to diskusijo do konca, mislim, da rabimo diskusijo o času. Poskusil bom podati kratko diskusijo o času.

»Čas« je dimenzija človeške imaginacije, ki je nastala v prazgodovini človeštva. Mi ljudje imamo bogato zgodovino uporabe časa. V praksi vsakodnevnega življenja bi bilo težko zamisliti življenje brez uporabe časa. Tudi v filozofiji in znanosti ima čas pomembno mesto.

Z opazovanjem narave lahko ugotovimo, da narava nima pojma časa za svojo dimenzijo. Za nas ljudi, ki smo vajeni uporabe dimenzije časa, je videti, kot da bi si narava vzela toliko časa, kolikor ga potrebuje.

Trajnostno preoblikovanje poteka in narava se nahaja v sedanjosti kot edini dimenziji. **Narava je vedno in samo v sedanjosti.** Glede na sistemsko ozadje narave se dogajanja nahajajo v eni možni dimenziji – več dimenzijski evoluciji naprej. Smer evolucije ni predvidljiva – se dogaja. Mi ljudje lahko raziskujemo, ali se učimo o naši preteklosti in preteklosti nam dosegljive narave, lahko opazujemo sedanjost, ne moremo pa predvideti prihodnosti.

Mislim, da je »čas« imaginarna dimenzija naše človeške civilizacije, ki je zelo uporabna za naš način življenja, razmišljanja, diskusij, raziskav itd. Narava nima dimenzije »časa«.

Dogajanja v naravi omogočajo informacije, medsebojno delovanje, medsebojna odvisnost in sodelovanje vse energije, materije, informacij, dimenzij, svetlobe in drugih žarkov, sil, delcev in nam še ne znanih vsebin narave ter se nahaja samo v sedanjosti.

Sistemske kvalitete in ozadja ter človeško razumevanje na osnovah potrebno in zadosti celostne vsebine pristopa ljudi (Mulej M., Kajzer S. 1998), bazirano na konceptu »dialektičnega sistema« kot omrežja vseh potrebnih gledišč po Muleju M. (1974) omogočajo sistemske kvalitete in okolje, znotraj katerega je potrebna celostna vsebina in celovitost narave obstajanja v sedanjosti. Ta je mogoča (za naše razumevanje) ali ne. Vsekakor je to trajnostno nadaljevanje, če mi to hočemo, ali ne.

Okoljske definicije:

1. **Osnovno okolje** (vesolje ali kozmos) je okolje, znotraj katerega narava obstaja kot **trajnostno nadaljevanje** vse energije, materije, informacij, svetlobe in ostalih žarkov, delcev, dimenzij, sil ter nam še nepoznanih vsebin narave. Osnovno okolje (vesolje ali



- kozmos) nima začetka ali konca, ampak vsebuje neštete oblike trajnostnega nadaljevanja energije, materije in informacij, transformacij, dimenzij in sistemov ter je samo sistem ali narava.
2. Znotraj osnovnega okolja (vesolja ali kozmosa) se nahajajo številne oblike energije, materije in informacij, večjih in manjših razsežnosti, kot sistemi oziroma spleti zvezd, galaksij in drugih. Med njimi so posamezne zvezde take, kot je naša zvezda Sonce.
 3. Osnovno okolje (vesolje ali kozmos) kot sistem/splet/celota omogoča medsebojno delovanje, medsebojno odvisnost in sodelovanje vse energije, materije, informacij, svetlobe in drugih žarkov, delcev, dimenzij, sil in še nam neznanih vsebin narave. Posledično ima vsak ali posamezen sistem, ki ga opazujemo - veliki ali mali pok, vidna ali nevidna materija, črne luknje, galaksije, zvezdni sistemi ter vse ostale oblike sistemov znotraj osnovnega okolja - svoje vsebine ali značilnosti, ki so njihove in so ločljive
 4. Okolje zvezdnega sistema je posamezna zvezda s svojim notranjim in zunanjim okoljem ali sistemi.
 5. Okolje posameznega planeta je del okolja sistema posamezne zvezde in ima svoje notranje in zunanje okolje ali sisteme.
 6. Okolje posamezne zvezde Sonca je del okolja naše galaksije, ki vsebuje 100.000.000.000 in več zvezd in ostalih oblik sistemov energije in materije. Vse oblike se gibajo kot vrtavka in cirkularno okrog središčnih sistemov vidne ali nevidne materije ali energije. Glede na medsebojno odvisnost, medsebojno delovanje in sodelovanje se zvezdni sistem Sonca vrti kot vrtavka in s hitrostjo okrog 800.000 kilometrov na uro okrog središča naše galaksije. Krožno gibanje je osnovna fizikalna lastnost vseh velikih in manjših sistemov materije in energije znotraj narave.
 7. Okolje planeta Zemlja je eno od osmih planetarnih območij sončnega sistema in je edino okolje planeta, ki ima okoljske pogoje primerne za pojav »žive narave«. Zemljina biosfera ima tri osnovna okolja: kopno, morja in oceane ter atmosfero.
 8. »Živa narava« okolja planeta Zemlja oziroma biosfera vsebuje ogromno število živih bitij, združb in civilizacij, med katerimi je tudi naša civilizacija Homo Sapiens. Vse skupaj si delijo okolje biosfere, ki je majhen del sistema okolja planeta Zemlja oziroma površja kopenskega, celotnega vodnega in nižjih delov atmosferekega okolja.
 9. Naša človeška civilizacija ima svoje globalno okolje različnih območij in značilnosti. V tretjem tisočletju prevladujejo mestna, več milijonska in manjša mestna okolja, ki jih je ustvaril človek. Poleg teh imamo še posamezna območja različnih dejavnosti kot so: kmetijstvo, gozdarstvo, industrija, šolstvo, šport, zdravstvo, obramba in vojska, transport in transportna sredstva in druga. V letu 2007 je bilo za potrebe človekovega življenjskega okolja na območju evropske skupnosti 17 % celotnega območja zasedeno in odvzeto naravi in naravnim procesom.
 10. Življenski prostor živih bitij lahko delimo na notranji in zunanji. Tipično notranje okolje je na primer sistem krvi in ožilja človeka, v katerem se nahajajo krvna plazma, celice in ostale vsebine. Zunanje človekovo okolje tvorijo družina, stanovanjski prostor, lokalna skupnost, itd. Vendar vse to so le deli celotnega internega okolja biosfere.
 11. Okolja, ustvarjena s človeško roko, imajo ravno tako notranja in zunanja okolja. Na primer, avtomobili imajo eksplozivni motor kot del notranjega okolja in ceste ter parkirišča kot del zunanjega okolja.

V uporabi je veliko različnih besed in pojmov o okolju, ki izhajajo iz vsebine ali oblike okolja. Zato mislim, da bi bilo potrebno te uskladiti ali natančneje definirati.



Pred zaključkom te predstavitve mislim, da je prav, da se dotaknem pojma okoljske vede ali znanosti. Mislim, da bi bilo najbolj primerno, da je osnovna okoljska znanost definirana v povezavi z osnovami narave: osnovnim okoljem in ostalimi pojavi, ki mu sledijo. Tako naj bi se knjiga filozofije fizike začela z osnovnim okoljem, vesoljem in kozmosom.

Priporočila:

Na koncu predstavitve okoljske teorije narave priporočam naslednje:

1. Pretehtati pravilnost uporabe sedanjih pojmov v povezavi z okoljem.
2. Uvajati sistemsko razmišljanje pri uporabi pojmov okolja.
3. Uvajati okoljske znanosti kot del pristopa k znanstvenemu delu naše civilizacije pri raziskavah osnovnih izhodišč narave.
4. Uporabiti sistemsko razmišljanje kot raziskovalno orodje. Mislim, da bi bila primerna skupna uporaba sistemske teorije in potrebno in zadosti celostne vsebine, kot je dialektična teorija sistemov prof. dr. (ekonomije) in dr. (upravljanja) Matjaža Muleja kot pristop ljudi, a pri opisnih sistemskih teorijah o naravi, druge, kot so teorije kompleksnosti, kaosa in druge, ki bi omogočile potrebno celovitost razumevanja, definiranja in preciznosti elaboracije po delih in glediščih.

4. Informacijska teorija narave

Informacijska teorija narave vrednoti energijo in materijo na enak način, temu pa se integralno dodaja informacija. S tem smo dobili izhodišče, ki upošteva osnovo narave v sistemu energija, materija in informacija. Vse se dogaja v nekem okolju, ki je predpogoj obstoja energije, materije in informacije.

Pretvorba energije, materije in informacije v povezano celoto, in predstavlja sistem, ki se nahaja v nekem okolju. Nadaljnja pretvorba poteka simultano v vseh elementih sistema: energija, materija, informacija in okolje.

Potek se dogaja kot medsebojna odvisnost, medsebojno delovanje in sodelovanje vseh udeležencev: energije, materije, informacije in okolja.

Tukaj podajam informacijsko teorijo narave kot opazovani primer sistemskega razmišljanja z namenom, da se odpre možnost spoznavanja osrčja narave.

Pomembno je, da se pravilno interpretira pomen besed, pojem, sistem, proces, informacija.

Informacija v tem opazovanem primeru ne pomeni procesa informiranja, ali prenosa podatkov in sporočil, zbirke podatkov ali skladiščenja istih, »informacija« ima v tem opazovanem primeru informacijske teorije narave naslednje možne pomeni;

- informacija je sestavni del okolja,



- informacija je sestavni del energije in materije,
- informacija ni samo sestavni del obstoječe energije in materije, ampak se stalno simultano pretvarja z ostalimi udeleženci opazovanega primera: energijo, materijo informacijo in okoljem,
- informacija, energija, in materija so del osnovnega okolja opazovanega primera v osnovnem okolju, vesolju ali dimenziji,
- informacija, energija, materija in okolje, kot sistem, proces, dogodek, in evolucija, upoštevajo pravila medsebojne odvisnosti, medsebojnega delovanja in sodelovanja v vseh delih, dimenzijah, nivojih sistema opazovanega celostnega primera. Pomeni, da se enačijo s celostnim osnovnim dogodkom in so del širšega sistema narave,
- informacija v pomenu opazovanega primera »informatijske teorije narave« je in predstavlja sposobnost, kvaliteto, kvantiteto, procesne možnosti okolja, energije, materije, svetlobe in drugih žarkov, sil, delcev in še nepoznanih vsebin narave. Vse se nahaja v širšem okolju – vesolju. Kot teorija omogoča raziskave in celostno obravnavo o osnovnih izhodiščih in dogodkih v naravi.

Informacijska teorija omogoča spoznavanje katerekoli celote, dela, enote, majhne, srednje ali velike dimenzije in neskončnega vesolja. Omogoča spoznavanje evolucije okolja, energije, materije, dimenzij, svetlobe in drugih žarkov, sil, delcev in še nepoznanih vsebin narave. Celostno spreminjanje se dogaja v medsebojni odvisnosti, medsebojnem delovanju in sodelovanju udeležencev. Pravila ni in dogajanja so posledica vseh vsebin opazovanega primera (osnovne celostne vsebine).

Okoljske značilnosti omejujejo ali omogočajo spremembe. Vzemimo primer nizko temperaturnega okolja atmosfere (-180 stopinj Celzija) in površja Saturnove lune Titan. Kot rezultanta pogojev obstajajo na Titanu reke in jezera, ki jih sestavlja tekoči metan. V takem okolju ni možne »žive narave«, kot jo poznamo na Zemlji.

Trajnostna sonaravna prihodnost človeštva je soodvisna od harmonije narave in vseh delov, udeležencev v opazovanem primeru – biosferi Zemlje. Ob uporabi dialektične sistemske teorije (Mulej) harmonija je mogoča.

Informacijska teorija narave dovoljuje spoznavanje preoblikovanja energije in materije v kateremkoli okolju, ki s sinergističnim sistemskim delovanjem omogoča naravo v okolju primerni vsebini.

Poglejmo dva enostavna primera.

Ko mosquito z vbodom v žilo človeka z namenom, da si preskrbi hrano, v sistem krvnih žil uvede povzročitelja malarije, ki se znajde v za njega optimalnem okolju. Takoj se začne hitro razmnoževati in pojavijo se bolezenski znaki malarije. V primeru, da se ne pristopi k zdravljenju, je možna smrt pacienta. Okolje, v katerem se je povzročitelj malarije razmnoževal, preneha obstajati.

Poglejmo teorijo velikega poka (Hawking) kot teorijo nastanka vesolja. Ta zanemara obstoj okolja in obravnava celostni primer našega dela vesolja kot edino celostno podobo. Mislim, da je bolj razumljivo, če vzamemo naš delček vesolja kot celostno podobo majhnega dela vesolja. Pri



upoštevanju okolja začenja teorija velikega poka pridobivati osnovno podobo opazovanega primera našega dela vesolja.

Z uporabo sistemske teorije, systemskega razmišljanja, sinteze in analize si omogočamo raziskave in spoznavanja, ki jim danes še nismo kos. Tako je mogoče spoznati naš delček vesolja, našo galaksijo, sistem zvezde Sonca, naš planet Zemljo in številne sisteme v biosferi kot osnovne vsebine celostnega opazovanega primera. Stvarno razumevanje narave bo v prihodnje mogoče in temu primerno se bo odzvala svetovna človeška skupnost ter omogočila trajnostno sonaravno prihodnost.

Informacijska teorija narave je manjkajoči delček v mozaiku človeške znanosti, ki bo lahko omogočil premikanje meja znanja o naravi. Potrebno je povezati klasične, specialistične in sodobne vede, ki so omogočile velika odkritja: teorijo velikega poka, kvantno teorijo, pospeševalnike delcev in še številna odkritja ter teorije z znanji v prihodnosti, da bi dosegli prehod v svetovno človeško skupnost prihodnosti.

5. Uvod v sistem klimatskih/podnebnih sprememb⁴

5.1. Povzetek

Človeška družba prehaja v čas globalizacije, ki je vsebinski izziv današnjega časa (Ećimović 2008). Izraža sedanji status globalne človeške družbe. Zanj so značilne nenaravne življenjske navade ali vsebine ljudi, ki živijo v velikih mestih, upravljanje tehnologij brez trajnostnih/sonaravnih vsebin, pomanjkanje dolgoročne odgovornosti posameznikov, držav in gospodarskih subjektov, nekontrolirana eksplozija reprodukcije človeštva, poznavanje le kratkoročnih in od časa do časa srednjeročnih škodljivih učinkov: sintetičnih kemičnih spojin, modernih tehnologij, vojaških tehnologij, eksplozijskega motorja, transportnega sistema, nuklearnih tehnologij, industrijske in kmetijske proizvodnje, lokalne, nacionalne in mednarodne razporeditve moči politikov in birokratov in njihovo usmerjanje dela globalnih, nacionalnih in lokalnih znanstvenih in šolskih institucij in izvajalcev vsebin. Vse to čedalje bolj povečuje razkorak med naravo in globalnim, nacionalnimi in lokalnimi sistemi človeške globalne skupnosti. Tako nastaja čedalje večji razmak med potrebami in rezultati sobivanja ljudi in narave planeta Zemlje.

Klimatske/podnebne spremembe, viharji, vetrovi, mogočne poplave in suše, tsunamiji, potresi, obsežna onesnaženja iz industrijske in kmetijske proizvodnje, mestnega življenja, transportnega sistema, spremembe v lokalnih klimatskih/podnebnih vsebinah, globalno segrevanje, tanjšanje ozonskega zaščitnega plašča ter onesnaževanja treh osnovnih sistemov biosfere zemlje, vode in zraka so vsebine napačnega dojetja sistema klimatskih sprememb na globalnem, nacionalnem in lokalnem področju človeške globalne družbe. Mistifikacija narave in neznanje o delovanju naravnih sistemov je vse bolj pogosta. Enostaven jezik za enostavne ljudi in razumljive razlage so vsebine uresničevanja trajnostne/sonaravne prihodnosti ali harmonije človeštva z naravo planeta Zemlje (Ećimović 2006/2008).

⁴ Tekst je vzeta iz knjige Uvod v sistem klimatskih/podnebnih sprememb, Ećimović, Timi, in Mulej, Matjaz, oktober 2008, 60 strani mehke platnice papirni tisk in CD, ISBN 978-961-91826-5-9



Poskušali bomo predstaviti pristop sodobne znanosti k mogoče najbolj pomembni vsebini današnjega človeškega globalnega sistema - sistema klimatskih/podnebnih sprememb. Mogoče je pomen tega še večji, ker se nahajamo ob prehodu v tretje tisočletje po Kristusu ali petnajsto tisočletje od prehoda rodovnega človeškega sistema k modernejšim oblikam sožitja in družbe – kameni, antični, srednjeveški, predindustrijski, industrijski, informacijski, inovacijski in globalni človeški skupnosti. Razumevanje vsebine sistema klimatskih/podnebnih sprememb ima bistven pomen za trajnostno/sonaravno prihodnost in možnosti preživetja človeštva v novo nastajajočih spremembah v kvaliteti življenjskih razmer in pogojev narave Zemlje. Trajnostna/sonaravna prihodnost lokalne skupnosti ali lokalnih skupnosti vodi v sonaravno/trajnostno prihodnost globalne človeške družbe (Ećimović 2006, 2008).

5. 2. Uvod v sistem klimatskih/podnebnih sprememb

Globalne raziskave in znanstveniki, raziskovalna in aplikativna tehnika za reševanje kompleksnih problemov, uporaba raziskav na podlagi primerov, celostni pristop, t.j. sistemsko razmišljanje, izobraževanje in tudi druge navade in dejavnosti ljudi kot posameznikov in družbe naj bi v prihodnje čedalje bolj upoštevali sistem klimatskih/podnebnih sprememb, saj ima ta vedno bistven in morda uničevalen vpliv na kvaliteto življenjskih pogojev v biosferi – našem naravnem okolju. S sedanjimi navadami namreč ljudje ustvarjamo na planetu Zemlji razmere, ki so pred milijoni let onemogočale življenje ljudi, dokler se niso spremenile v take, kakršne zdaj zopet uničujemo. Vidimo, da sta delovanje sistema klimatskih/podnebnih sprememb in sposobnost posameznikov in družbe, da omejujejo nevarno delovanje sistema klimatskih/podnebnih sprememb med najbolj negotovimi vsebinami našega življenja v prihodnje.

Sistem klimatskih/podnebnih sprememb, ki omogoča, zagotavlja, vzdržuje in ohranja kvaliteto življenjskih pogojev biosfere – našega naravnega okolja, ima veliko večji pomen, kot so ljudje mislili v preteklosti. Za biosfero planeta Zemlje oziroma naše naravno okolje ima bistveno nalogo omogočati, zagotavljati, vzdrževati in ohranjati življenjske pogoje, katerim se prilagajajo vse oblike življenja na Zemlji. Izginotja mnogo življenjskih oblik v preteklosti in sedanjosti so posledice sprememb v življenjskih pogojih v njihovem naravnem okolju, katerim se niso mogle prilagoditi. Spremembe življenjskih pogojev nastajajo zaradi delovanja sistema klimatskih/podnebnih sprememb, ki so v veliki meri posledica enostranskega obnašanja ljudi.

Biosfera – naše naravno okolje je posledica delovanja sistemov planeta Zemlja, ki to omogočajo na osnovi **medsebojne odvisnosti, medsebojnega delovanja in sodelovanja** (Ećimović, Mulej, Mayur 2002) celotne mase, energije in informacij⁵ v časovnem okviru treh osnov biosfere oziroma našega naravnega okolja vode, zemlje in zraka.

Vsaj ocenjevanje, če že ne preprečevanje rizika posledic, imenovani stranski učinki kratkoročnega, srednjeročnega in dolgoročnega pomena, bi moralo biti nujen del osnovne ali aplikativne raziskovalne dejavnosti, vendar ni bilo običajen del raziskovanja v času industrijskega in kasnejših obdobj. Niti v poindustrijskem, informacijskem, inovacijskem niti v današnjem globalizacijskem sistemu življenja ljudi na področjih industrijske in

⁵ Prosimo pogledjte »The Information Theory of Nature, and« Ećimović, 2006, dostopno na domači strani: www.institut-climatechange.si



kmetijske proizvodnje, sintetičnih kemičnih spojin, denarne demokracije⁶, individualne in organizacijske družbene odgovornosti, upravljanja tehnologij še niso upoštevale sonaravne oziroma trajnostne vsebine. Nuklearne tehnologije, eksplozijski motorji, transportni sistem in drugi so onesnaževali v nerazumno dolgem času vse tri osnove našega življenja: zemljo, vodo in zrak. Danes je pomembno vprašanje, kdaj in kako bodo škodovali naravnim oblikam življenja vključno z nami. Zelo pomembno za znanost in človeštvo je razumevanje **medsebojne odvisnosti, medsebojnega delovanja in sodelovanja celotne mase, energije in informacij** v okolju, od vesoljskega do okolja Zemlje, biosfere - oziroma v našem življenjskem okolju. To naj bi omogočilo napore za doseganje trajnostne/sonaravne prihodnosti človeštva oziroma njegove harmonije z naravo planeta Zemlja. Priporočamo sistemsko razmišljanje in dialektično sistemsko teorijo (Mulej⁷) za odgovorno delo v prihodnje.

Danes posamezniki in družba v praksi uporabljajo naravo, okolje in biosfero oziroma naše življenjsko okolje kot brezplačno dobrino brez vrednosti. Mislimo, da je to danes bolj zapleteno vprašanje. Spreminjajoča se kvaliteta narave, delovanje in blaženje delovanja sistema klimatskih/podnebnih sprememb narekujejo naše priporočilo za:

- sistemsko razmišljanje z dialektično sistemsko teorijo, ki povezuje delo ljudi in njihovo ustvarjalnost s primerno celostnim razmišljanjem ter omogoča pravilne odločitve in usmeritve v rednem delovanju ter inoviranju,
- ustvarjanje celovitejšega odnosa človeštva do narave, posledica bodo boljši pogoji v naravi in sožitje.

Mislimo, da je pomembno, da se poučimo o omejitvah in vplivih delovanja sistema klimatskih/podnebnih sprememb in si izdelamo jasne poglede na posledične spremembe, ki lahko škodljivo delujejo na človeštvo in naravo planeta Zemlje. Predstavili bomo nekatere osnove sistema klimatskih/podnebnih sprememb z namenom, da prispevamo k razumevanju naših priporočil.

Voda, zemlja in zrak kot sistemi biosfere ali našega naravnega okolja so osnova življenja na planetu Zemlja. Danes ni veliko znanstvenikov in raziskovalcev seznanjenih s sistemom delovanja narave na osnovah **medsebojne odvisnosti, medsebojnega delovanja in sodelovanja**.

Sodobne raziskave na osnovah sistema razmišljanja in sistem klimatskih/podnebnih sprememb pomembno vplivajo na poznavanje narave, ki naj bi človeštvu omogočilo boljše razumevanje delovanja človeške globalne skupnosti na biosfero planeta Zemlja - na naš življenjski prostor.

Z vidika narave je sistem klimatskih/podnebnih sprememb alias klima oziroma klimatske spremembe niz/sistem/kompleks določil znotraj življenjskega prostora biosfere. V resnici biosfera sama je življenjski prostor, ki je le manjši del zemeljskega planetarnega sistema.

⁶ Denarne demokracije ali države z demokratičnimi sistemi, katerih vrhovni poglavar je denar, ki ima tako pomembno vlogo, da ni samo poglavar, ampak je dosegel lastno reprodukcijo in status monstuma (Ećimović 2005).

⁷ Zasl. prof. ddr. Matjaž Mulej, Univerza v Mariboru, med drugimi tudi v knjigi *System Thinking and Climate Change System*, Ećimovića, Muleja, Mayurja, 2002, dostopni na domači strani: www.institut-climatechange.si



Opazovanje klime in vključevanje opazanj v človekove odločitve sta dve povsem ločeni zadevi, posebno v zadnjih stoletjih, ko je industrializacija prevzela vodilno vlogo in sprožila razvoj ozkih profesionalnih specializacij z namenom vladati in prevladovati.

Obstajata dva glavna vzroka klimatskih/podnebnih sprememb: naravni vzroki in vzroki, ki jih je povzročil človek. Poznati bi morali obe vrsti, da bi lahko upoštevali vzroke in eventualno preprečili ali lajšali njihove hude učinke na človeštvo (n.pr. poplave, suše, viharne vetrove, ipd.).

Sisteme (kot kompleksne pojave, ne kot mentalne slike o njih) lahko razdelimo glede na njihovo velikost v:

MAKRO/MEGA/SUPERIORNE/ZELO VELIKE sisteme, kot so vesolje, največji človeštvu znan sistem, rimska cesta, sončni sistem, sistem planeta Zemlja ipd, in

MIKRO/INFERIORNE/MANJŠE/SUB sisteme, ki so manjši in so ali naravni, kot na primer Homo Sapiens, rastlinstvo, živalstvo ali druga živa bitja, ali umetni, ki jih je ustvaril človek, kot so na primer mesta, transportna sredstva itd.

Zgoraj navedeni naravni sistemi in sistemi, ki jih je ustvaril človek, zahtevajo tudi delitev znanosti na tehnične, naravoslovne in socialne vede, od katerih pa nobena ne vključuje vseh človekovih aktivnosti kot integralni del narave. Zato menimo, da ne obstajajo naravni in umetni sistemi, temveč so vsi naravni toliko časa, dokler so rezultat aktivnosti živih bitij. Zavedamo se, da za mnoge lahko dolgo traja, da bodo razumeli tako filozofijo, zato bomo trenutno še uporabljali termine umetni in naravni sistemi.

Sistemska teorija, razmišljanje, analiza in sinteza so danes najboljša pomoč človeštvu za razumevanje zapletenosti problemov, ki jih predstavljajo tako makro, kot mikro sistemi. Ne obstaja enostaven sistem in ne obstaja sistem, za katerega bi lahko trdili, da o njem vemo vse. To moramo posebno poudariti, ko govorimo o sistemskem razmišljanju, ki razlikuje med razmišljanjem današnjega časa in razmišljanjem jutrišnjega dne.

Izzivi današnjemu človeštvu so mnogo kompleksnejši, kot kdajkoli prej, ker smo ljudje dospeli do nekakšnega kritičnega vrha naših zmožnosti razumeti današnji čas. Dokaz za to je naš odnos do narave, prostora in okolja, ki namesto, da bi bil prijateljski, postaja vedno bolj neprijazen. Antropocentrična filozofija naše civilizacije, njen današnji socialni red, religiozni pristop/vladanje, zaslužkarsko naravnane demokracije, lokalne, nacionalne, internacionalne birokracije in birokracija Združenih narodov, totalitarni režimi, pomanjkanje spoštovanja med različnimi ljudmi in narodi na zemlji, politika razdeli in vladaj (od antike do danes), kruha in iger, prevlada informacijskega monopola – vse to so organizacijske metode, ki potrebujejo prestrukturiranje/inovacijo za nov – celovitejši – pristop za boljši jutri. Ali bo naša civilizacija imela boljši jutri, ali ne, je vprašanje, na katerega je bolje poiskati odgovor pred njenim zlomom. Bodimo optimisti in verjemimo, da bo jutri naša civilizacija zmogla razumeti naravo, vesolje, okolje, klimatske/podnebnne spremembe, kozmos in druge sisteme. To razumevanje bo široko odprlo vrata trajnostni/sonaravni prihodnosti za vse človeštvo na planetu Zemlja.

Trenutno razumevanje klimatskih/podnebnih sprememb je omejeno zaradi antropocentričnih – t.j. le človeku prilagojenih in podrejenih – in drugih pogledov. To bi preprečila uporaba



sistemske teorije, razmišljanja, analize in sinteze. Omogoča nam boljše razumevanje medsebojnih odvisnosti in učinkov mono-, multi-, inter-, in supra-disciplinarnih problemov kot integralnih delov inferiornih in superiornih sistemov v okviru sistema planeta Zemlje in nadalje v okviru sončnega sistema⁸, sistema rimske ceste in vesolja.

Narava se ne ponavlja, ampak gre vedno le v eno smer: naproti večdimenzionalni dinamični prihodnosti. Smer te evolucije ni znana.

Človeštvo si z vsemi svojimi verovanji in religijami, naravnimi, družbenimi in tehničnimi dosežki, tehnologijami, vladavinami, lokalnimi skupnostmi, družinami in odnosi slej ko prej domišlja, da je božanstvo, ki je poklicano, da vlada naravi, vesolju in okolju biosfere. Ko pride do točke za skupno akcijo, skupen interes in preživetje naše civilizacije, je na razpolago mnogo pripravnih izgovorov za nedejavnost, kot so tako imenovani nacionalni interes, nacionalna varnost, nacionalni blagor ipd. Vendar so vsi ti izgovori le prazne fraze, primerne za ohranitev oblasti in koristi individualnih ali kolektivnih voditeljev oziroma nacionalnih elit. Verjamem v vlogo vodenja, vendar verjamem tudi v zmeren stil življenja, ki omogoča daljše življenje, mir in stabilnost, kajti to zahteva narava.

Kako je današnje razumevanje klimatskih/podnebnih sprememb odvisno od človekovega vpliva, lahko najboljše pojasnimo z vlogo politikov in mednarodnih birokracij, ki imajo dovolj finančnih virov za plačevanje znanstvenikov, da pišejo in govorijo po njihovih željah. Preusmeritev znanstvenih in uporabnih dosežkov ter teoretičnega dela je skoraj nemogoča, dokler pristranski gospodarstveniki, politiki in birokracije upravljajo sredstva. Naučili so se, kako vladati/gospodariti, ne pa, kako ustvariti pogoje za primerno celovit in ne ozko usmerjen razvoj v znanosti in tehnologijah sistema planeta Zemlja. Kako pojasniti fantastičen razvoj oborožitvene idr. industrije, kemičnih sintetičnih proizvodov, milijardo in več eksplozivnih motorjev (avtomobili, letala, ladje, čolni, poljedelski idr. stroji), transportnih sistemov, k trženju in v ustvarjanje dobička usmerjenih proizvodov, promocijo globalizacije kot orodja za proizvodnjo denarja, medtem ko znanstveniki niso plačani, da bi opravljali bazne raziskave in morajo zanemarjati raziskovalno delo, ki je potrebno za razumevanje pojavov v sistemu biosfere, ki so zaradi dejavnosti človeštva in odgovora sistema klimatskih/podnebnih sprememb in celotne biosfere nevarni naši civilizaciji?

Verjetno je to zato, ker je spregledana
»tragedija skupne lastnine« - zanemarjanje primerne celovitosti.

Sistem klimatskih/podnebnih sprememb je naravni makro sistem, sestavljen iz mnogih med seboj povezanih/delujočih nadrejenih in podrejenih sistemov, in ne reagira le na naše civilizacijske aktivnosti, temveč tudi na pravila drugih sistemov v naravi. Če ne razumemo sistema klimatskih/podnebnih sprememb, je to zaradi nepravilno usmerjenih raziskav/razvoja. To ni povezano z navadnimi ljudmi, temveč z enostransko opredelitvijo družbene ureditve, dobičkonosno usmerjenimi demokracijami in mednarodnimi birokracijami (posebno narodov G7/25), ki vodijo našo civilizacijo. Primanjkuje jim celostnega razumevanja, zato ustvarjajo pogoje za enostranske človekove aktivnosti.

⁸ Govorimo o sistemu, ne o množici. Po teoriji sistemov matematično sestavljata sistem dve množici: množica sestavin in množica odnosov med njimi (in z okoljem). Iz slednjih nastajajo sinergije lastnosti, ki jih ima celoten sistem, sestavine same pa ne. Zato bi govor o množici pomenil, da kot nekoč spregledujemo povezave in njihov bistveni pomen. To povzroča ogromen del sodobnih težav in potreb po dragi obnovi življenjskih pogojev ljudi.



Vzemimo primer CFC-jev, sintetičnih kemičnih spojin, ki povzročajo razpad ozona, in so jih bolj kot za dobrobit človeštva proizvedli zaradi tržno usmerjenega razvoja in pridobivanja dobička. Pri tem so povzročili, da je klimatski sistem reagiral s svojimi spremembami in grozi s totalnim uničenjem naše civilizacije. Naučiti se moramo, kako upravljati/gospodariti sami s seboj. Res je, da človeštvo ni vedelo o stranskih učinkih CFC-jev, a danes so nam ti znani. Zaradi tega ni več vzrokov za nadaljevanje s prejšnjo prakso uporabe substanc, za katere ne vemo, kako medsebojno delujejo z medijem, kjer se nahajajo, z uporabo tehnologije gensko spremenjenih organizmov, oboroževalne tehnologije, enostranskega razvoja in uporabe novih kemičnih sintetičnih proizvodov in eksplozijskih motorjev, ki so trenutno najnevarnejše aktivnosti naše civilizacije ipd. Ne smemo pozabiti omeniti informacijske tehnologije in tehnologije prenosa energije, ki lahko vplivajo na magnetna polja in temelje zemeljskega ravnovesja.

Od energije in plinov do planetarnih raziskav, to je povzetek razvoja Zemlje od rojstva pa do danes⁹.

Sistem klime/klimatskih/podnebnih sprememb je sistem biosfere, ki omogoča, zagotavlja, vzdržuje in ohranja pogoje za življenje. Kot naravni (pod)sistem je podrejen biosferi, planetu Zemlja, soncu in solarnemu sistemu, sistemu rimske ceste in vesolju. Kasneje si bomo ogledali posamezne sisteme. Sistem klimatskih/podnebnih sprememb ima več podrejenih (pod)sistemov, kot so: atmosfera, morja/oceani, kopno in druga območja, povezana z biosfero. Vsi omenjeni sistemi imajo podrejene (pod)sisteme, ki skupaj tvorijo celovit sistem biosfere. Vse naštetje je potrebno razumeti kot medsebojno odvisne, medsebojno delujoče in sodelujoče gibljive, neodvisne, med seboj delujoče, dialektične in dinamične sisteme, ki se stalno spreminjajo. Smer gibanja je samo dinamična evolucija naprej. Za nezainteresiranega človeka je lahko narava videti kot kaos, vendar je narava, kot je napisal pokojni prof. dr. Helmut Metzner v svojem delu »Chaos to Bios«, lahko videti kot kaos za človeštvo, A tudi dosežke naše civilizacije lahko narava šteje za kaos in ne za red, kot si domišljamo. Primerno celovito znanje in etika naj odločita, kaj je prav, kaj narobe.

Sistem klimatskih/podnebnih sprememb je zelo zapleten sistem, ki je medsebojno odvisen, medsebojno delujoč in sodelujoč ter soodvisen s številnimi podrejenimi in nadrejenimi sistemi. Glavni namen sistema klimatskih/podnebnih sprememb je vzdrževanje energetskega ravnovesja, t.j. temperature, sistema ciklusa vlage/vode, sestave troposfere, atmosfere in oceanskih tokov. Mnoge druge podrejene sisteme bomo pojasnili kasneje.

Vsekakor sistema klimatskih/podnebnih sprememb ne moremo pojasniti/razumeti ali raziskovati z znanjem na področju ene ali dveh trenutno znanih znanstvenih disciplin, temveč z znanstvenim raziskovanjem, ki bazira na primerno celovitem multidisciplinarnem, interdisciplinarnem ali celo supradisciplinarnem pristopu, ki ga opravlja skupina znanstvenikov, ki delajo za skupen cilj na sinergijski osnovi. Jasno je, da morajo znanstveniki za kompleksno reševanje problemov delati po principu sistemske teorije, razmišljanja, analize in sinteze, da bi bilo delo pri raziskovanju narave uspešno.

Supradisciplinarnost je pri našem raziskovanju s stališča naravoslovnih ved predpogoj za posameznika, da bi lahko razumel kompleksne probleme kompleksnih sistemov.

Za razumevanje delovanja sistema v regularnih pogojih in v pogojih, ki so odvisni od samega sistema ter od superiornih in inferiornih sistemov, ali pa celo soodvisni z njimi zaradi oboje

⁹ Iz pogleda naše civilizacije.



smernega vpliva, kakor tudi za pravilno razumevanje potrebnih raziskav, dela in ukrepanja ima supradisciplinarno delo/raziskovanje prednost pred klasičnimi znanstvenimi disciplinami. Slednje so še vedno uporabne, a za zgolj fazne izide in ob jasnem zavedanju, da so delne in pristranske, dokler se ne povežejo v sinergije z drugimi.

Glavna naloga sistema klimatskih/podnebnih sprememb je omogočanje, zagotavljanje, vzdrževanje in ohranjanje pogojev za življenje znotraj biosfere in zahteva razlago, kaj je življenje. Na osnovi raziskav na področju naravoslovnih znanosti in drugih ugotovitev vidimo, da življenje lahko pojasnimo s hipotezo v naslednji enačbi:

$$\text{ENERGIJA(E)} \times \text{MATERIJA(M)} \times \text{INFORMACIJA(I)} + \text{ČAS(Č)} = \text{ŽIVLJENJE(Ž)}$$

$$E \times M \times I + \check{C} = \check{Z}$$

Pri tem naj bi življenje razumeli kot pojav življenja na planetu Zemlja, ki ima edinstveno sestavo, fiziko, geografijo in biologijo ter neprestano razvija svojo naravno, prostorsko in okoljsko kvaliteto, odseva trenutno stanje sistema in kvaliteto svojih superiornih in inferiornih sistemov. Sestavni del nastanka biosfere je informacija, ki je pri definiciji bistva in oblike specifičnega živega bitja soodvisna z energijo in materijo; izraža vpliv, ki ni niti energetski niti materialni, ampak vsebinski. Primer: zakaj se iz nekega zarodka razvije slon, iz drugega bolha; zakaj iz človeškega zarodka nastanejo vsi organi? Osnovna informacija, povezana s samim življenjem, je v njegovih genetskih strukturah, ki so sestavljene iz štirih aminokislin v različnih kombinacijah v sistemih, specifičnih za vsako posamezno vrsto, za katero so bile sestavljene sočasno (v teku evolucije). Prva informacija o življenju je nastala istočasno s pojavom prve oblike življenja, kasnejše pa so bile refleksija/posledica evolucije.

Življenjski pogoji niso zbirka, temveč prej sistem/bistvo kvalitete okolja biosfere in predpogoj za nastanek/pojav/obstoj življenja. Evolucijska teorija, teorija Gaia, sistemska teorija, znana preteklost in sedanjost ter stanje biosfere potrjujejo zgornjo hipotezo.

Začetek klimatskega/podnebnega sistema in sistema klimatskih/podnebnih sprememb je dinamika planeta Zemlje, njen nastanek in obstoj, kot dela nastanka in obstoja solarnega sistema in kot rezultat dinamike vesolja.

Sistem klimatskih/podnebnih sprememb na planetu Zemlja ne vlada nad življenjskimi pogoji na povelje, temveč z medsebojno odvisnostjo, medsebojnim delovanjem in sodelovanjem ter posledicami sistemske dinamike.

Tukaj lahko omenimo vpliv človeka/sedanje civilizacije na sistem klimatskih/podnebnih sprememb, ki jo lahko opišemo kot sprožilca sistemske dinamike zaradi naših aktivnosti. To bomo komentirali kasneje.

6. Kratka zgodovina planeta Zemlja, kot podrejenega sistema vesolja

Planet Zemlja je nastal približno pred 4,5 milijarde let (4.500.000.000).



V tistem obdobju je bil planet nekaj kot krogla, skupek energije in plinov s temperaturo okrog 7.000 stopinj Celzija. V teku milijonov let se je planet ohlajal in v teku dvesto tisoč milijonov let se je tvorila trdna materija. Najstarejše kamenine na zemlji datirajo izpred 4,3 milijarde let.

Planet Zemlja je inferiorni sistem solarnega sistema, rimske ceste in vesolja.

Vesolje je makro, največji in najbolj zapleten sistem, ki ga človeštvo danes lahko raziskuje. Sestoji se iz vseh vrst informacij, materije, svetlobe in drugih oblik sevanja in energije, iz vsega, kar obstoja kjerkoli. Zajema tudi planet Zemljo, vse na njem in znotraj njega ter vse v sončnem sistemu. Naše osončje sestavlja devet večjih planetov (8 po novejši razlagi) in na tisoče kometov in manjših planetov, ki jih imenujemo asteroidi. Središče je sonce, zvezda, okrog katere krožijo planeti.

Če razvrstimo vse informacije o vesolju/naravi kot 100 enot, lahko celotno znanje današnje civilizacije postavimo med prvo in drugo enoto. Raziskati moramo še mnogo več, kot smo do sedaj. Seveda pa ne smemo pozabiti dinamike in razvoja sistemov, kar presega današnje znanje o vesolju.

Če razumemo holistično naravo vesolja, lahko razumemo, da je dinamika vesolja prisotna v nešteto dimenzijah, oblikah, tranzicijah, ekspanzijah, velikih in malih pokih, pojavih in izginotjih ter v nešteti dogajanjih.

Drugi omejen del vesolja, kjer obstajamo, je rimska cesta. Je naša prva tarča raziskav in sistem, o katerem moramo spoznati kolikor mogoče veliko. Rimsko cesto sestavlja okrog sto milijard in več zvezd v kakršnikoli obliki in nešteto planetov, mikro planetov in asteroidov ter vseh drugih oblik energije, materije, informacij, naravnih sil, dimenzij, svetlobnih in drugih žarkov, in raznih vrst delcev ter še nam nepoznanih vsebin.

Sestava planeta Zemlje znotraj solarnega sistema je edinstvena zaradi materije, energije in informacij ob njenem rojstvu.

Vse oblike/vsebine, ki so obstajale v trenutku nastanka, so vključene v sistem planeta Zemlja, kakor tudi mnoge druge oblike in vsebine iz vesolja, kot so energija, materija, informacije, svetlobni in drugi žarki, delčki in še nam neznane vsebine, ki so v teku časa od nastanka pa do danes prišle v stik z njo.

Največji vpliv na dinamiko planeta Zemlja prihaja od nenehnega toka energije iz Sonca in od trkov z asteroidi, ki prihajajo iz izven zemeljskega planetarnega prostora. Potrebno je upoštevati to znanje, ki nam lahko pomaga pri raziskovanju sistema klimatskih/podnebnih sprememb, kajti prvi vpliv na sistem klimatskih/podnebnih sprememb prihaja iz zunanjega vesolja, kot so asteroidi in druge nevarne kolizije, ki so spreminjale in še vedno lahko spreminjajo ravnovesje sistema planeta Zemlja in tudi sistema klimatskih/podnebnih sprememb.

Iz preteklosti se lahko naučimo o številnih vzrokih, na katere je reagirala Zemljina klima z dinamičnimi posledicami za pogoje življenja. Poznamo ledene dobe, ki so bile posledica znižanja temperature kopnega in oceanov.

Seveda ne smemo pozabiti, da masa kopnega in masa oceanov reagirata na spremembo povprečne temperature različno. Masa kopnega reagira hitreje od mase slane vode. Posledično



je bilo med ledenimi dobami življenje na kopnem (30% zemeljske površine) bolj prizadeto, kot življenje v morju.

7. Medsebojna odvisnost, medsebojno delovanje in sodelovanje narave in življenja, sistema klimatskih/podnebnih sprememb in biosfere oziroma našega naravnega okolja

Medsebojna odvisnost, medsebojno delovanje in sodelovanje narave in življenja, sistema klimatskih ali podnebnih sprememb in biosfere tvori dinamične faktorje za razvoj različnih oblik življenja in posledično za stanje okolja. Prvotna Zemlja je pred kakimi 4,5 milijardami let bila brez življenja in neprepoznava za naše civilizacijske standarde. Zrak je bil brez kisika in mnogi podsistemi klime, ki jih poznamo danes, niso obstajali. Sam sistem klime pa se je razvijal glede na medsebojno odvisnost, medsebojno delovanje in sodelovanje sistema Zemlje, kakor se razvija še danes.

Začetek življenja na Zemlji odseva pogoje prvobitne narave, okolja in prostora, njene fizikalne in druge vsebine. Za evolucijo/pojav življenja na Zemlji je narava potrebovala približno 0.7 milijarde let. Prvi dokazi življenja datirajo izpred 3.8 milijarde let.

Od pojava mikroorganizmov v primordialni/prvobitni dobi do razvoja kompleksne biosfere pred 1.2 milijardami let je bilo obdobje, ko je evolucija omogočila nastanek biosfere. Posledica prve energetske spremembe biosfere od anaerobne do aerobne proizvodnje energije kot dejavnosti mikroorganizmov je bila sprememba atmosfere iz atmosfere brez kisika v atmosfero, bogato s kisikom. Koncentracija kisika je bila takrat okrog 40% in se je postopoma zniževala na 21%, kakršna je bila ob koncu 19. stoletja.

Pojav kisika je pomenil glavno spremembo življenjskih pogojev in predstavlja največjo razliko med biosfero primordialne/pradavne/prvobitne dobe in dobe izpred 1,2 milijarde let do današnjega časa. Koncentracija kisika v zraku, ki ga vdihavajo živa bitja, ne sme pasti pod 8%, kar je nekako minimum za preživetje. Trenutno v nekaterih gosto naseljenih predelih velikih mest koncentracija kisika lahko doseže nekaj nad 10%.

Zaradi tega priporočam monitoring koncentracije kisika kot predpogoj za preživetje ljudi v občutljivih in močno onesnaženih okoljih velikih mest.

Prve naselbine naše civilizacije so nastale približno pred 12.000 leti kot rezultat izboljšanja družbenih pogojev pred antičnih ljudi. Prve naselbine v Evropi so zaradi varnosti nastale v močvirnatih predelih s populacijo do 10.000 ljudi. Bile so rezultat spremenjenih pogojev znotraj biosfere, ki so nastali po zadnji ledeni dobi, ki se je končala pred 60.000 do 16.000 leti.

Od takrat naprej so bili klimatski pogoji na zemlji skoraj enaki današnjim. Seveda so spremembe obstajale, vendar ne tako ekstremne, kot jih beležimo sedaj.

Razlika med današnjim časom in časom izpred 200 let je nastala zaradi ogromnega prispevka tehnologij naše civilizacije v biosfero, kot so n.pr. stranski učinki in odpadki nuklearnih tehnologij, sintetičnih kemičnih spojin, posledice eksplozije človeške populacije in uničevanje



biosfere zaradi različnih postopkov za zadovoljevanje človekovih potreb. Na kratko (detajlno jih bomo obdelali kasneje), to so vplivi in posledično učinki naše civilizacije na klimatske spremembe.

Sistem klimatskih/podnebnih sprememb je zapleten naravni sistem. Sestoji iz več podsistemov in je obenem tudi podsistem sistemov, kot so sistem planeta Zemlje, solarni sistem, rimska cesta in vesolje. Predstavlja zelo star sistem, ki se nenehno spreminja ter nudi precej stabilne pogoje za vse oblike življenja. V sedanjem klimatskem/podnebnem sistemu se po stoletjih industrializacije in postindustrializacije dogajajo mnogo bolj ekstremne spremembe kot kdajkoli od konca zadnje ledene dobe. Človek ni edini vzrok teh nevarnih procesov, čeprav je eden od zelo pomembnih, še posebno, če naše odločitve in dejanja bazirajo na pomanjkanju systemskega, primerno holističnega razmišljanja.

Sistem klimatskih/podnebnih sprememb je integralni del zemeljske biosfere in se nahaja nekako med njenimi inferiornimi in superiornimi sistemi. Vsi skupaj s sistemom klimatskih ali podnebnih sprememb imajo številne medsebojne odvisnosti, delovanja in sodelovanja.

Kot smo že omenili, vesolje zajema vso materijo, energijo, informacije, svetlobne in druge žarke, naravne sile, razne oblike delcev in še nam nepoznane vsebine in sploh vse. Na zemeljski klimatski/podnebni sistem ima vesolje lahko dramatičen vpliv.

V primeru sprememb v solarnem sistemu in v primeru trčenja Zemlje s telesi iz vesolja je lahko ogrožen njen obstoj. Zgodilo se je že in lahko se ponovno zgodi. Obstoja namreč hipoteza, da je trčenje Zemlje s kozmičnim meteoritom pred 65 milijoni let povzročilo izumrtje dinozavrov.

Najsuperiornejši sistem je vesolje, ki predstavlja medsebojno odvisnost, medsebojno delovanje in sodelovanje med vesoljem, rimsko cesto in solarnim sistemom in je največji nam znani sistem.

Možnost destruktivnega medsebojnega delovanja med Zemljo in sistemom vesolja je zelo majhna. Ker v vesolju obstaja nešteto ozvezdij in drugih oblik, ima Zemlja malo možnosti, da bi doživela uničenje zaradi aktivnosti odaljenih sistemov vesolja. Zemlja je namreč zelo majhen delček tega sistema.

Solarni sistem je z našega gledišča zelo velik sistem, vendar z galaktičnega gledišča in še bolj z gledišča vsemirja zelo majhen. Sonce s svojimi devetimi planeti (osmimi po novi klasifikaciji) je majhen podsistem galaksije rimske ceste. Dejansko ima galaksija rimske ceste sto milijard in več zvezdnih sistemov in naš sončni sistem je le eden od njih.

Sonce je centralna zvezda sončnega sistema in ima 99,8% mase celotnega sistema. Je center svojega sistema in izvor vse materije, energije in informacij znotraj njega.

Seveda je inferioren sistem napram rimski cesti, ki je po materiji 100.000 milijard krat večja od solarnega sistema. Sončni sistem kroži okrog centra galaksije rimske ceste s hitrostjo okrog 250 km na sekundo.

Za zemeljski planetarni sistem je Sonce izvor vsega od rojstva naprej in mi obstajamo, ker nas Sonce oskrbuje z energijo, toploto, svetlobo in z vsem potrebnim. Naš planetarni sistem je v celoti odvisen od Sonca.



Naša sedanost je odraz fizikalnih, bioloških in drugih stanj, v katerih se nahaja v tem trenutku.

Seveda vpliv sončnega sistema ne izvira le iz Sonca, temveč tudi iz medsebojnih odvisnosti, medsebojnega delovanja in sodelovanja celotnega sistema, sistemov sosednjih planetov, planetom podobnih teles različnih velikosti, meseca in drugih oblik informacij, energije, materije in naravnih sil. Planet, najbližji Soncu, je Venera, oddaljenejši pa Mars.

Skupaj z Merkurjem predstavljajo trdne planete solarnega sistema. Drugi štirje planeti Jupiter, Saturn, Uran in Neptun so giganti planeti v plinastem stanju na obrobju našega sončnega sistema.

Zadnji planet Pluton (ki po novi klasifikaciji to ni več) ni vedno zadnji zaradi svoje ovalne orbite, ki ga včasih postavi pred Neptun, čeprav je večino časa najbolj oddaljen od Sonca.¹⁰

Sončni sistem je stabilen in spremembe znotraj samega sistema se odražajo na celotnem sistemu.

Najpomembnejši deli sistema so energetske tokovi od Sonca do planetov in kvaliteta posameznih planetarnih sistemov. Ne le sestava, temveč tudi oddaljenost planeta od Sonca sta faktorja, odločilna za kvaliteto solarnega sistema. Svetloba in toplotni žarki iz Sonca omogočajo življenje na Zemlji.

Kvaliteta sončnega sistema, edinstvena sestava in oddaljenost Zemlje od Sonca so medsebojno odvisni, medsebojno delujoči in sodelujoči deli lastnosti, ki omogočajo življenje na Zemlji.

Razumevanje mnogih neznanih sil v naravi, kot so magnetizem, energija, transformacija materije, radiacija, vloga delcev in podobnega, gibanje sončnega sistema (kot vrtavka, orbitalno, galaktično, vesoljsko), Sonca in planetov vključno z Zemljo, je pomembno. Zato je mogoče sklepati na značilnosti, medsebojno odvisnost, medsebojno delovanje in sodelovanje ter aktivnosti celotnega sistema.

Premer Sonca je 109 krat večji od premera Zemlje in 400 krat večji od premera Meseca. Vseh osem planetov in drugih oblik znotraj sončnega sistema kroži okrog Sonca. Sonce in vsi planeti se gibljejo kot vrtavke in skupaj krožijo znotraj rimske ceste. Vse to gibanje je potrebno natančnejše raziskati, da bi lahko razumeli osnovne sile, ki so posledica medsebojne odvisnosti, medsebojnega delovanja in sodelovanja med posameznimi deli sončnega sistema in celotnega vesolja. Sončni sistem deluje glede na obstoječe sisteme tako kot vsi drugi sistemi; naša civilizacija ima možnost raziskovati in razumeti naravo ter naš obstoj.

8. Sistem planeta Zemlja

¹⁰ Pojem planetov po vsebini in izrazoslovlju se spreminja. Sedaj se omenja 11 planetov ali 8 glede na velikost teh in naše pojmovanje. Za vsebino tega prispevka mislim, da je v redu, da se navajajo planeti kot so bili sredi 20. stoletja.



Zemeljski planetarni sistem je zelo mogočen. Trenutno znaša premer notranjega jedra 2400 km. Sestavljeno je iz železa in težkih kovin. Premer zunanjega jedra znaša 2300 km, spodnjega plašča 2300 km, zgornjega plašča 650 km in skorje 3 – 72 km.

Na površju zemeljske skorje se dogajajo neprestane spremembe. Povzročajo jih naravne sile, ki so omogočile tudi nastanek in obliko zemeljske površine. Atmosfera prekriva, ščiti ter zaključuje biosfero planeta do 1000 km višine, kjer se eksosfera končuje v vesolje.

Glavni podsistemi Zemlje so njena planetarna masa, njena luna in atmosfera. Premer planeta znaša 7700 km. Po velikosti je Zemlja peti največji planet po premeru, največji je Jupiter z enajstkrat večjim premerom, najmanjši pa do nedavnega planet Pluton s približno eno petino manjšim premerom od premera Zemlje.

Površina Zemlje skupaj z atmosfero tvori njeno biosfero, kjer živimo in kjer je bilo življenje njen sestavni del več kot 3.8 milijarde let. V tedanje obdobje namreč lahko postavimo prvi pojav mikroorganizmov.

Med dejavniki, ki omogočajo življenje na Zemlji, je najpomembnejši dejavnik kisik, ki se pojavlja v življenjskem okolju oziroma biosferi in sicer:

- dva anorganska oksida – vodo in ogljikov dioksid, ki omogočata življenje,
- atmosfero s kisikovimi molekulami v zraku, ki ga dihamo, in
- ozonski plašč kot zaščito pred UV žarki.

Ko so bili razviti ti pogoji v sistemu biosfere, je bil pojav življenja le še vprašanje časa.

Zunanji del podpore za nastanek življenja na Zemlji je tok svetlobe in toplote, ki prihaja od Sonca, kar omogoča primerna oddaljenost Zemlje od Sonca.

Primerna oddaljenost od Sonca je pomembna, kar potrjujeta sosednja planeta Venera in Mars, ki nimata pogojev za življenje, kot so na naši Zemlji.

Edinstvena sestava planeta Zemlja in njegova oddaljenost od Sonca sta dve kvaliteti, ki sta se razvili v teku nastanka in razvoja solarnega sistema in predstavljata dva ključna pogoja za nastanek življenja na Zemlji.

Površino zemeljske skorje trenutno pokriva okrog 30% kopnega in okrog 70% oceanov in morij. Razmerje med oceani in kopnim se je spreminjalo z dinamičnimi spremembami pri oblikovanju zemeljskega površja.

Prvi pojav vode na Zemlji je bil odločilen za nastanek njene površine in atmosfere. Po ohladitvi je bila atmosfera gosta in mnogo tanjša, kot je danes.

Primordialna/prvobitna atmosfera je bila brez kisika.

Veliko spremembo je pomenil pojav prvih oblik življenja, ki so bili anaerobni mikroorganizmi, ki za življenje niso potrebovali kisika. Vodik, potreben za sintezo različnih organskih ogljikovih spojin, so črpali iz raztopljenih anorganskih ogljikovih spojin.



Za spremembo primordialne Zemlje in njene anaerobne faze v aerobno je bilo potrebnih več sto milijonov let. Pomemben faktor pri tem razvoju je bil padec koncentracije ogljikovega dioksida, ko so mrtve celice sedimentirale na dno oceanov, kjer so se pretvorile v številne ogljikove spojine, kar danes predstavljajo fosilna goriva.

Bil je čas prve energetske transformacije, ko so bili mikroorganizmi sposobni pretvoriti molekule sladkorja v dve enoti energije na molekulo.

V naslednjih generacijah so bili mikroorganizmi sposobni s pomočjo sončne svetlobe razcepiti molekule vode in izkoristiti sproščeni vodik za redukcijo molekul ogljikovega dioksida.

S pomočjo te fotosinteze je bila proizvedena bogata biomasa. Končni produkt teh reakcij je bil kisik, ki je bil za obstoječe oblike življenja strupen. Popolnoma je spremenil življenje in nove generacije mikroorganizmov so bile sposobne z dihanjem izkoriščati kisik s pomočjo oksidacije biomase.

To je bila prva energetska tranzicija na Zemlji, kajti s tako pretvorbo molekul sladkorja je bilo pridobljeno 36 enot energije oziroma 18 krat več kot pri anaerobnih mikroorganizmih.

Zaradi svoje topnosti je bil ogljikov dioksid del vode, medtem ko kisik ni topen v vodi in je postal integralni del atmosfere.

Koncentracija kisika v atmosferi se je zviševala in spreminjala ter se ustalila pri 21%. 78% je predstavljal dušik, preostali 1% pa ogljikov dioksid, metan in nekateri drugi plini.

S pojavom kisika v atmosferi in pod vplivom sončne radiacije so se kisikove molekule cepile na elementarni kisik, ki se je v zgornji plasti atmosfere pretvarjal v trivalentno molekulo kisika - ozon.

Sčasoma je ozon ustvaril za UV žarke nepropustno plast, zaščitni ozonski plašč zoper tisti spekter žarkov iz Sonca, ki so bili bistveni za razgradnjo dioksidnih molekul – UV žarki.

Biosfera na Zemlji je reagirala z bohotnim razvojem življenja, z njegovo razširjenostjo in s prehodom življenja iz vode na kopno.

Bakterijsko življenje je s prehodom na kopno ustvarilo na površju z ogljikom bogato plast, kar se je sčasoma spremenilo v to, kar danes imenujemo prst.

Zemeljski sistem se je razvil do take stopnje, da so se lahko pojavile tudi bolj kompleksne oblike življenja.

To se je dogajalo pred približno 700 milijoni let. Kopenski sesalci so se pojavili pred približno 350 milijoni let, predhodniki človeka pred približno 8 milijoni let, Homo Sapiens pa pred kakimi 200.000 leti.

Tukaj smo torej. Imamo vesolje, rimsko cesto, sončni sistem, sistem planeta Zemlja, življenje na kopnem in v vodi ter atmosfero.



Z obstoječimi vplivi superiornih sistemov, posebno sončnega sistema, in s posameznimi deli zemeljskega sistema je nastal sistem klimatskih ali podnebnih sprememb, ki omogoča, zagotavlja, vzdržuje in ohranja kvaliteto življenjskih pogojev znotraj biosfere.



9. Potreba celostno/sistemske razmišljati kot osnovni princip razumevanja sistema klimatskih/podnebnih sprememb

Opisana dejstva ne pomenijo, da človeštvo nima nobenega vpliva na klimatske spremembe. Imamo ga in njegova vsebina je odvisna od našega razmišljanja in obnašanja. Naša enostranskost je popolnoma naravna in istočasno enako nevarna, ker sčasoma lahko vodi do našega izumrtja. Bolje, da nekaj dodamo, to je holistično sistemsko razmišljanje: tabela 1.

Sistemske / celovite razmišljanje	Nesistemske / enostranske razmišljanje
1. Soodvisnost/i, odnos/i, odprtost, dialektični sistem vidikov	Neodvisnost, odvisnost, zaprtost, posamičen vidik
2. Kompleksnost (in tudi kompliciranost)	Poenostavljenost, kompliciranost, deli sami
3. Atraktorji, vplivne sile (zato odnosi)	Izolacija, nič vplivnih sil (zato nič odnosov)
4. Emergenca, emergiranje (zato sinergija)	Nič procesov, ki ustvarjajo nove lastnosti
5. Sinergija, sistem, hierarhija sistemov	Nič novih lastnosti na osnovi odnosov
6. Celota in celovitost, medstrokovnost	Samo deli in lastnosti delov, enostrokovnost
7. Omrežje, medsebojni vplivi (strok, ..)	Nič medsebojnih vplivov (strok, ..)

Tabela 1: Povzetek osnovnih lastnosti sistemskega razmišljanja

Sistem klimatskih/podnebnih sprememb je sestavni del zemeljske biosfere. Ni jasno načrtanih meja z drugimi sistemi in naravo, kakor mi ljudje radi mislimo in vidimo. Sistem klimatskih ali podnebnih sprememb je del zapletenega naravnega sistema, ki aktivno jemlje, uporablja, dodaja, vpliva, sodeluje z vsemi superiornimi in inferiornimi sistemi, in odseva trenutno stanje življenjskih pogojev. Opazovalec gre lahko nazaj v preteklost v zgodovino razvoja, ne more pa iti v prihodnost zaradi neštetičnih možnih vplivov.

Razliko med tradicionalnim razmišljanjem in sistemskim razmišljanjem o klimatskih spremembah lahko opišemo na sledečem primeru. Če opazovalec gleda na dosežke naše civilizacije z vidika gradbene dediščine, je videti vse lepo in prav. Linije so geometrično opredeljene in celotna konstrukcija je videti kot tradicionalen, stilen in arhitekturni dosežek. Seveda pravilo ne velja sto odstotno, kajti veliki katalonski arhitekt Gaudi je na primer predstavil svoj inovativen pristop h gradnji cerkva in drugih konstrukcij. Tudi naša bivališča, zunanja in notranja oprema, kmetijske dejavnosti, komunikacije, ceste in železnice ipd. sledijo nekemu redu, ki ni videti tak kot nedotaknjena narava.

Nam ljudem današnje civilizacije je nedotaknjena narava videti kot kaos in pri tem nismo sposobni videti, da narava na nas gleda obratno. Težko je pojasniti, ali je razlika med naravo in človekovim načinom življenja velika ali majhna, jasno pa je, da je človek povzročil mnogo različnih posegov, ki niso naravni. Za to je razlog konvencionalni način razmišljanja, da je kaos narave kaos, naš način razmišljanja pa je red. Po drugi strani pa nam sistemska teorija razmišljanja omogoča, da vidimo kaos narave kot red in človeški red kot vrsto kaosa. Ko bodo tudi povprečni ljudje v lokalnih skupnostih, ne le znanstveniki, sposobni razmišljati na tak način, bomo imeli mnogo več od kontakta z naravo, kot imamo sedaj.



Če prenesemo zgornja razmišljanja na sistem klimatskih/podnebnih sprememb, lahko razumemo »kaos« kot medsebojno odvisnost, medsebojno delovanje in sodelovanje kot vpliv ter delovanje mnogih različnih naravnih sistemov, ki so deli zelo zapletenega sistema klimatskih/podnebnih sprememb. Pri tem ne smemo pozabiti, da je tako razmišljanje ljudi z vsemi njihovimi dobrimi in slabimi lastnostmi.

Klimatske/podnebne spremembe so zbirka stalne evolucije narave, ki podpira biosfero kot prostor za živa bitja znotraj narave.

Videli smo odvisnost sistema klimatskih/podnebnih sprememb od superiornih sistemov, zato naj najprej naštejemo vplive, ki jih imajo na biosfero.

Vse spremembe v sončnem sistemu zagotovo imajo vpliv na biosfero. Na Zemljo imajo močan vpliv in če se pojavijo, bodo lahko usodne za našo civilizacijo.

Za boljše razumevanje vplivov Sonca na našo biosfero je potrebno več znanstvenega dela. Kot glavni dobavitelj toplote in svetlobe ima Sonce velik vpliv na biosfero. Velik vpliv ima tudi razmerje med Mesecem in Zemljo.

Na našo biosfero so v preteklosti že vplivali in v prihodnosti tudi še bodo meteorji in meteoriti iz vesolja, rimska cesta, sončni sistem, kakor tudi druge oblike materije, energije, informacij delcev in žarkov ter naravne sile in sistemi, ki jih niti še ne poznamo.

Lastnosti planeta Zemlje, ki jih proučujejo fizika, geografija, biologija, imajo osrednjo vlogo. Zaradi neprestane medsebojne odvisnosti, medsebojnega delovanja in sodelovanja so naravne sile ustvarile našo biosfero, ki jo tudi vzdržujejo.

Človeštvo lahko vidi njeno preteklost in sedanjost, lahko razumemo dinamiko nekaterih omenjenih sistemov/sil, vendar ne vseh. Naše trenutno znanje nima dovolj systemskega razmišljanja, da bi bolje razumeli systemske soodvisnosti, sinergije in dinamiko.

Notranje zemeljsko jedro ima premer okrog 2400 km in se giblje kot vrtavka z drugačno hitrostjo, kot drugi deli planeta. Vsaka sprememba v vrtenju in smeri gibanja ima lahko močan vpliv na zemeljski sistem. Potrebno je več raziskav, da bi lahko razumeli ta podsistem ter njegovo soodvisnost z drugimi sistemi.

Ostala Zemlja, zunanje jedro, spodnji in zgornji plašč ter skorja, ki predstavljajo okrog 7600 km v premeru, imajo številne medsebojne vplive, ki vplivajo na biosfero. Nenehne spremembe Zemlje povzročajo premike površja v plošče, ki se zaradi notranjih sil neprestano gibljejo druga proti drugi. Vulkanski izbruhi in potresi so posledice velikih premikov teh plošč, trkov ali ločevanja. Obe aktivnosti imata kompleksen vpliv na našo biosfero, od direktnih lokalnih katastrofalnih učinkov lave, pepela in premikov tal, do obsežnejših vplivov v primerih močnih erupcij in velikih količin pepela v atmosferi. V tem primeru vplivajo na celotno biosfero.

Naravne sile, kot so gravitacija, magnetne sile, elektrika, krožno gibanje, vrtenje kot vrtavka in skupno kroženje znotraj solarnega sistema, rimske ceste in vesolja, so zelo pomembne, vendar jih naša civilizacija še ne pozna v celoti.



Sistem klimatskih/podnebnih sprememb je sistem, ki omogoča, zagotavlja, vzdržuje in ohranja pogoje življenja znotraj naše biosfere, ki ga sestavljajo številni sistemi, ki so medsebojno odvisni, delujoči in sodelujoči pri ustvarjanju sedanjih pogojev. Če razmišljamo globalno, lahko sistem klimatskih/podnebnih sprememb opazujemo na posameznih vzorcih ali razlikah, ki prikazujejo različne vrednosti temperature, vlage in tokov.

Biosfero sestavljajo kopno, voda in atmosfera. Značilnosti teh sistemov so osnovni okviri, znotraj katerih sistem klimatskih/podnebnih sprememb omogoča, zagotavlja, vzdržuje in ohranja pogoje življenja, katerim naj bi se vse vrste življenja prilagajale.

Dobro znana geografska dejstva zemljepisna dolžina, širina in višina pogojujejo toploto in svetlobo, kar se odraža v kvaliteti lokalnega okolja. Po drugi strani pa je distribucija teh kvalitet odvisna od karakteristike zemlje in vodnega okolja. Seveda je kvaliteta okolja bolj zapletena na mejah, kjer se različna okolja stikajo. Ni enostavno, če upoštevamo še zapleteno medsebojno odvisnost, delovanje in sodelovanje različnih sistemov, ki kakorkoli vplivajo na sistem klimatskih/podnebnih sprememb.

Iz izbranih tem je najbolj pomemben vpliv na biosfero življenje na Zemlji. Kakor hitro je bila primordionalna Zemlja pripravljena gostiti življenje, se je to pojavilo. Prvo, ki je kasneje vplivalo na poznejše bivanje, je bilo anaerobno življenje mikroorganizmov v oceanih. Zaradi izjemnega bogastva oceanskih voda, ki so bile polne anorganskih spojin, so imele prve bakterijske celice odlične pogoje za življenje. Oceanske vode so jih ščitile pred UV žarki, imele pa so tudi primerno temperaturo. Sončna svetloba in toplota sta imeli nižje radiacijske vrednosti, kot danes. Anaerobno življenje ali življenje brez kisika je obstajalo od prvih začetkov do približno 3.8 milijarde let. Takrat, pred približno dvema milijardama let, se je v atmosferi pojavil kisik. Bakterije so zemeljsko biosfero spremenile iz biosfere brez kisika v biosfero, bogato s kisikom, ki je bila nezaščitena pred UV žarki, in v biosfero z ozonsko zaščitno plastjo pred UV žarki. Sterilno kopno se je spremenilo v zemljo, bogato z življenjem. S spremembo anaerobnega v aerobno življenje se je biosfera spremenila in razvile so se mnoge kompleksnejše oblike življenja. Vodni cikel, kisikov cikel, cikel ogljikovega dioksida, cikel žvepla in odpadnih organskih snovi skupaj z življenjem samim so bili sestavni deli biosferskega okolja. Najpomembnejša je bila sprememba sterilnega okolja v okolje, primerno za življenje. Rezultat je bila zaščita zemeljskega površja pred korozijo in drugimi rednimi ali občasnimi pojavi, kot so uničevanje prsti, spreminjanja oceanskih tokov in gibanja zraka. Biosfera se je razvijala in postala življenjski prostor za živa bitja. Fizikalne, geografske, kemične in systemske soodvisnosti, delovanje in sodelovanje so zagotavljale možnosti za razvoj življenja, ki je podpiralo okolje. Še danes najdemo znotraj zemeljske biosfere tako primordionalne/pradavne pogoje, kakor tudi pogoje kasnejše evolucije, ki je sledila. Naša sedanja biosfera ima številne podsisteme, ki z medsebojnim dopolnjevanjem zagotavljajo kontinuiteto življenja v trenutnem in drugih možnih in spremenjenih okoljih.

Kopno, od zaledenelega arktičnega/antarktičnega okolja do tropskih predelov, je prebivališče velikega števila različnih živih bitij, ki imajo skupaj udobno življenje toliko časa, dokler sledijo sistemski soodvisnosti, medsebojnemu delovanju in sodelovanju. Vse ekološke razlike so del vzdrževanja izmenjave materije v okolju, kjer se je razvilo nešteto biosferskih podsistemov, ki so vključeni v nadaljevanje življenja. Spremembe in razvoj so posledica medsebojnih delovanj, učinkov in sodelovanja vseh sistemov. Enako velja tudi za vodno in atmosfersko okolje. ***Biološki sistem uravnava pogoje življenja znotraj biosfere.***



Sonce nas oskrbuje s svetlobno in toplotno energijo. Zaščitna sistema Zemlje sta ozonska zaščitna plast v stratosferi (15-24 km) in učinek tople grede (naravni deli tega učinka so ogljikov dioksid, metan in dušikov oksid). Oba sistema filtrirata/transportirata radiacijsko energijo na površino Zemlje in nazaj v vesolje. Na zemlji je trenutno 30% kopnega in 70% vodnih površin (oceani, jezera). Razmerje energije predstavlja vnos in odboj energije. Sprememba pri vnosu in oddaji znotraj energetske bilance predstavlja ogrevanje ali ohlajanje. Vendar reakcija ogrevanja in ohlajanja zaradi raznovrstnosti pogojev na Zemlji, kot so spremembe v atmosferi, na kopnem in v vodi, spremembe v biologiji površja ter antropogeni vplivi, ni vedno enaka. Gibanje zraka in oceanski tokovi dodatno vplivajo na to zapletenost.

Ravnotežje energije je najpomembnejši sistem za ohranitev življenja. Spremembe ravnotežja delujejo uničevalno na biologijo naše biosfere. Rezultat so izumiranja živalskih, rastlinskih in bakterijskih vrst ter pojavljanje novih oblik življenja. Drastične spremembe so znane kot pojav ledenih dob. V preteklosti je Zemlja doživela več ledenih dob¹¹.

10. Krog vode – pomembna vsebina sistema klimatskih/podnebnih sprememb

Vodni ciklus predstavlja eno od razlik med planetom Zemlja in drugimi planeti našega osončja Marsom, Venero in Merkurjem. Je del biosfere in je bil ustvarjen ob rojstvu Zemlje. Vodni ciklus je podsistem biosfere, ki predstavlja kvalitetno in kvantitetno osnovo njenega okolja. Po rojstvu Zemlje se je takoj po ohladitvi pojavila voda v tekočem, trdnem in plinastem stanju; vodni ciklus je začel svoje pomembno delovanje/oblikovanje. Kot okolje ima voda odlične sposobnosti transporta in izjemne možnosti medsebojne odvisnosti, medsebojnega delovanja in sodelovanja različnih spojin ter je verjetno skupaj z drugimi sistemi, kot so sestavljanje in gibanje oblakov, bliskanje in naravna električna, sodelovala pri nastanku življenja. Življenje se je pojavilo v vodnem okolju in je potrebovalo skoraj dve milijardi let, da se je iz morja/vode preselilo na kopno. Na Zemlji je 97.3% vode v oceanih in morjih, 2.1% vezane v ledenikih, 0.6% v vodotokih in jezerih. Zanemarljive količine pa predstavlja voda v živih bitjih in vlažnosti zemlje. Navzlic temu je voda nujen del biosfere, ki je bil pogoj za nastanek življenja. V telesih živih bitij je 75-95% vode in več. Voda je glavni transportni sistem znotraj celic, tkiv in teles. Voda je glavno okolje za kemične procese v naravi. Voda je glavni arhitekt narave za oblikovanje gorstev, jezer, rek in oblikovanje površja.

Ž I V L J E N J E I N V O D A ,
V O D A I N Ž I V L J E N J E ,
Ž I V L J E N J E ,
V O D A .

(Iz knjige Ećimović/Jan/Vrhovšek, »Slovenija včeraj, danes in jutri, gospodarjenje z vodo, izziv Slovincem v tretjem tisočletju«, Ljubljana, 1998.)

¹¹ Preglednico ledenih dob in še katere risane predstavitve delov sistema klimatskih/podnebnih sprememb lahko vidite v »Atlasu« na: www.institut-climatechange.si



Gibanje vode/tokove v oceanih in morjih povzročajo razlike v temperaturi in slanosti morske vode, pasatni vetrovi ter vpliv in delovanje drugih sistemov Zemlje (gravitacija, gibanje Zemlje in zraka, ravnotežje energije, gravitacija Meseca in Sonca itd.).

Voda in zrak stalno medsebojno delujeta in sodelujeta, ko se voda spreminja iz tekočega v plinasto stanje. Hlapi se prenašajo po zraku. Pri spremembi temperature in s pomočjo zračnih delcev (fizikalnih ali biotskih) se hlapi spremenijo v trdno in tekoče stanje in pridejo na zemeljsko površino v obliki padavin. Gorovja so vodni stolpi kopnega, gozdovi pa so primarni vodni filter in njen transportni sistem v podzemlje. Vodotoki prenašajo vodo na nižje ležeča območja in skupaj z biološkim sistemom predstavljajo sekundarni vodni filter. Reke so tudi glavni transportni sistem za prenos mineralnih sestavin iz gora in višje ležečih območij v nižine in na koncu v morje.

Če vode iz višjih leg ne najdejo svojih poti na nižja območja, nastanejo jezera, ki s svojim biotskim življenjem predstavljajo jezerski vodni sistem. Seveda imajo jezera lahko svoj rečni dotok in iztok, vendar je glavnina jezerske vode pod nivojem iztoka. Jezera so višje ležeči rezervoarji vode.

Močvirja, močvirni gozdovi in močvirna območja so najboljši biotski filtri vode. Običajno so na nižje ležečih področjih in kot estuariji. Povsod, kjer se stikata voda (slana ali sladka) in kopno, so biološko najbogatejša območja. Izmenjava snovi na planetu Zemlja je možna zaradi aktivne transportne vloge vode in zaradi aktivnosti biološko bogatega okolja, ki skrbi za naše zdravje s prečiščevanjem površinskih kopenskih voda.

Podzemeljske vode transportirajo vodo pod zemeljsko površino in zagotavljajo vodo v vodnih izvirih. Obstajajo velike podzemeljske vode v globinah pod kopnim in pod dnom oceanov/morij, ki so nastale tam zaradi premikov zemeljske skorje. Obstajajo podzemna jezera, ki so bogata z minerali in običajno sterilna.

Gibanje površinskih voda je rezultat višine in gravitacije. Voda ima zlata vredno lastnost, da se giblje navzdol (gravitacija), v mirujočem stanju pa ima ravno površino.

Kopenske, biološke in atmosferske vode predstavljajo manj kot 1% vode na zemlji, vendar so, zaradi vodnega ciklusa, zelo pomemben podsistem biosfere.

11. Zrak in atmosfera - še ena pomembna vsebina sistema klimatskih ali podnebnih sprememb

Med Zemljo in vesoljem je do višine 1.000 km obsežno območje plinov, žarkov, delcev in naravnih sil, ki ga imenujemo atmosfera. Prvih 10-15 km imenujemo troposfera, spodnji del atmosfere.

To je področje, ki vpliva na vreme, ker ima najmočnejše gibanje zraka. Tukaj se formirajo in premikajo oblaki, tukaj lahko tudi najdemo živa bitja, od ptic, mikro-organizmov do semen rastlin. Troposfera prehaja v stratosfero, ki sega 15-50 km od zemeljske površine in vključuje ozonski plašč (15-24 km). Mezosfera (50-85 km) in termosfera (85-400 km) prehajata v eksosfero, ki se izteka v vesolje pri približno 1.000 km.



Atmosfera, plinasto pokrivalo zemeljske površine, je sestavni del biosfere in celotnega sistema planeta Zemlje. Sprejema, prenaša, odbija, ustvarja obroč okrog zemeljske površine za sončne žarke, svetlobo in toploto, kakor tudi za žarke, delce, telesa iz vesolja in naravne sile, s katerimi pride v stik planet Zemlja kot celota.

99% atmosfere tvorita dva glavna plina: dušik 78% in kisik 21%. Kot vse v naravi, se njuna porazdelitev, gibanje in koncentracija spreminjajo v omejenih okvirih. Preostali 1% predstavljajo ogljikov dioksid, metan, vodni hlapi, dušikovi oksidi, argon in drugi plini. Kisik je prisoten kot dioksid, ozon, ogljikov dioksid in vodni hlapi. Kot dodatek so kot prispevek naše civilizacije prisotne dodatne količine ogljikovega dioksida, dodatne količine metana, dušikovih oksidov, klorofluorogljikov, hidrofluorogljikov, perfluorogljikov kot plinov tople grede. Pomembni fotokemični plini, ki indirektno prispevajo k učinku tople grede, so ogljikov monoksid, dušikovi oksidi in nemetanske hlapljive organske spojine (NMVOC).

Katalitična razgradnja ozona v stratosferi kaže na nekatere splošne reakcije v stratosferi.

Atmosfera je največji del biosfere. Ima pomembno vlogo, ker zaradi vsebnosti kisika omogoča življenje, kajti kisik je plin, ki vzdržuje življenje. Po drugi strani je atmosfera medij za transport vodnih hlapov, nastajanje oblakov in glavni prenašalec v vodnem ciklusu, ki je važen iz vidika biologije. Gibanje zraka v multi dimenzionalnem prostoru je regularno ali iregularno.

Trenutno lahko v sklopu delovanja sistema klimatskih/podnebnih sprememb beležimo ekstremne premike zraka. Za biosfero je gibanje zraka pomembno zaradi prenašanja oblik življenja, preskrbe z vlago in sestavljanja lokalnih vremenskih razmer. Po drugi strani je gibanje zraka sovražno do človekovih konstrukcij, ki jih uničuje, če so zgrajene s prenizkimi standardi glede na jakost vetrov/tornadov/tajfunov.

Ogljikov cikel je bil verjetno najpomembnejši v primordialnem/pradavnem zemeljskem obdobju, ker je vplival na nastanek zemeljske skorje in na tvorbo depozitov ogljikovega ciklusa na oceanskem/morskem dnu in na zemeljskem površju. Je direkten proizvod bioloških in deloma kemijskih procesov biosfere.

Ogljik je gradbeni element biosfere. Izmenjava ogljika znotraj življenja rastlin je zelo hitra (manj kot 1 leto). Če govorimo o hitri izmenjavi ogljika, je danes na prvem mestu druga izmenjava ogljika. Hitra izmenjava ogljika (1-10 let) poteka v prsti in na površini oceanov in morij, počasna (10-100 let) pa v gozdovih. Zelo počasna izmenjava ogljika (več kot 100 let) je v biosferi pomembna zaradi nalaganja ogljika s pomočjo delovanja mikroorganizmov in zaradi nalaganja sedimentov v obliki kalcijevega karbonata. Zaradi relativno počasnega ogljikovega ciklusa v naravi in zaradi relativno hitrega dodajanja ogljika v biosfero z delovanjem naše civilizacije smo v situaciji, ki je obstoječi naravni sistemi ne morejo kompenzirati. To je eden od razlogov za globalno ogrevanje.

Žveplov cikel je bil v času, ko naše civilizacije še ni bilo, manj pomemben cikel. Ima sicer svojo vlogo v naravi, vendar naša civilizacija oddaja v naravo tako velike količine žvepla, da postaja že škodljiv faktor (kisli dež). Žveplo je sicer esencialni element za življenje na Zemlji. Tudi glede njega se obnašamo premalo celovito.



12. Naša civilizacija kot motnja v delovanju sistema klimatskih/podnebnih sprememb

Naj bo inferioren ali superioren sistem biosfere, planeta Zemlje, solarnega sistema ali vesolja, je naša civilizacija majhen, toda kljub temu vpliven sestavni del vsega skupaj. Danes govorimo o naših problemih zaščite narave, prostora in okolja. Zaščite pred kom? Že veliki grški filozof Platon je pred več kot 2.000 leti zapisal:

»Če bi v gorah Atike še rastle gozdovi, bi bogata prst sprejela vodo in jo skladiščila, tako da bi se absorbirana količina postopoma razpošiljala iz višin in napajala studence. Vendar je sedaj bogata zemlja izprana in obstaja le še nerodoviten okvir pokrajine, ki ga lahko primerjamo s skeletom bolnega telesa«.

Ljudje nismo pravilno imenovali sistemov za pomembne in nepomembne, kajti vsi so sistemi, ki so medsebojno odvisni, medsebojno delujejo in sodelujejo in na ta način ustvarjajo pogoje, ki so danes vidni v biosferi. Toda človeštvo doslej ni sledilo navodilom narave, naj upošteva medsebojno odvisnost, medsebojno delovanje in sodelovanje. Dialektična teorija sistemov, o kateri se da brati tudi v knjigi »Sistemsko razmišljanje in sistem klimatskih sprememb«¹², ponuja bolj vzpodbudne možnosti, kot splošna sistemska teorija.

Sistem klimatskih/podnebnih sprememb kot integralni del zemeljske biosfere ima večji vpliv na našo civilizacijo kot ljudje verjamemo ali mislimo. V absolutnem smislu nam sistem klimatskih/podnebnih sprememb, ki omogoča, zagotavlja, vzdržuje in ohranja življenjske pogoje, omogoča življenje. Vendar mi ljudje s svojim modernim odnosom do narave in drug do drugega ne spoštujemo teh dejstev in poskušamo vse, da bi kolikor mogoče škodovali sistemu klimatskih/podnebnih sprememb, čeprav na srečo še vedno ne toliko, kot bi se dalo.

Obstaja teorija človekovega vmešavanja v sistem klimatskih/podnebnih sprememb, ki poskuša razložiti vzroke za klimatske spremembe, ki jih povzroča naša civilizacija zadnjih 200 let (1.800 do 2.000). O tej teoriji bi želeli razpravljati in oceniti njeno izvedljivost. Filozofijo o tem so napisali že pred mnogimi stoletji, ko je nastala zgodba o Davidu in Goliatu. Toda na osnovi naših standardov mi ljudje ne opazimo svojih majhnih možnosti (kot David) in vplivov in ne vemo, kaj pravzaprav smo, kaj je naš naravni sistem, s katerimi sistemi medsebojno delujemo in s katerimi smo soodvisni, in kam spadamo. Kar razumemo, je kako s pomočjo dosežkov naše civilizacije ustvarjati denar in kako za to izkoriščati naravna bogastva, vse do zlorabe, ker premalo upoštevamo tako imenovane stranske učinke. Kaj povzročajo naši posegi in kakšni bodo rezultati, ki niso povsem neposredna zadovoljitev naših trenutnih potreb, večine ljudi ne zanima. Kar se tiče naše civilizacije na Zemlji, se moramo zavedati kapacitete biosfere, ki naj bi zadoščala za vsa živa bitja, ne da bi bilo človeštvo prizadeto. Smisel ohranjanja življenja/človeštva ni le v tekmovanju za ozko in kratkoročno opredeljene koristi, temveč večinoma v sodelovanju. Adam Smith, na katerega se sklicujejo zagovorniki tekmovanja namesto sodelovanja, ni zapisal tako, kot oni berejo: poudarjal je soodvisnost med specialisti in zahteval preglednost in družbeno odgovornost, ne pa ozke sebičnosti, ki vsaj na dolgi rok povzroča veliko težav med ljudmi in v odnosu ljudi do narave ter narave do ljudi.

¹² »System Thinking and Climate Change System«, Ećimović, Mulej, Mayur, 2002, je dostopna na domači strani: www.institut-climatechange.si



Dokler bomo živeli na dosednji način, kot noji z glavo v pesku, ne da bi prevzeli dolgoročno odgovornost za dejanja naše civilizacije in njene učinke na našo lastno biosfero, toliko časa bomo povečevali probleme med našo civilizacijo in našo naravo/našo biosfero.

Ni planet Zemlja dom naše civilizacije, temveč biosfera, ki je le majhen delček planeta Zemlja. Občutljivost obeh se razlikuje.

- Kakšno je trenutno stanje naše civilizacije,
- ali vidimo našo civilizacijo zadosti holistično kot sistem in
- kakšno sodelovanje potrebujemo za trajnostno/sonaravno prihodnost naše civilizacije, so vprašanja, ki so življenjsko pomembna le za naš obstoj. Ne gre za obstoj planeta Zemlje.

Če sprejmemo teorijo o izvoru naših prednikov, se je vrsta Homo Sapiens pojavila približno pred 200.000 leti, prve naselbine pred približno 12.000 leti (prve naselbine v Evraziji), velike kulture (Kitajska, Indija, Mezopotamija, Egipt, Perzija) pred 7.000-3.000 let; lahko razpravljamo o tem, od kod smo. Toda kaj smo z vidika naravoslovnih ved? Biologija biosfere in planeta Zemlje ni vključena v nobenem starem zapisu ali v filozofiji naših prednikov. Religije, stalna opora naše civilizacije, so izum naših prednikov, a nikoli niso obravnavale njenega izvora. Središče je bil vedno človek in način, kako dobiti od ljudi in narave čim več. Med seboj so se prepletale ekonomija, obstoj in ideologija. Zavojevalci, kralji, voditelji, demokrati iz preteklosti (kot so stari Grki pred približno 2.500 leti) ter sedanji verski in drugi duhovni voditelji, politiki in mnogi drugi, ki so se sami oklicali, bili izvoljeni ali nastavljeni, so bili proizvod svojega časa in so vladali, kot pač so. Plemenske zgodbe o ljudeh in njihovih voditeljih opisujejo, kaj smo, ne razpravljajo pa, kaj počnemo z našim življenjem in kakšen vpliv ima naša civilizacija na biosfero.

Če sprejmemo znanstveno stališče, da smo sestavni del biosfere planeta Zemlje – narave – in po zapletenosti vrh drevesa življenja na planetu Zemlja z naravoslovnega vidika, in sistemsko teorijo kot osnovo našega razmišljanja, lahko rečemo, da pripadamo biosferi planeta Zemlja kot njen medsebojno odvisni, delujoči in sodelujoči podsistem.

Naša civilizacija je torej eden od mnogih sistemov življenja znotraj biosfere planeta Zemlja in lahko trdimo, da smo ena od civilizacij planeta Zemlja. In katere so druge civilizacije? Na podlagi naših raziskav lahko pokažemo na mnoga živa bitja in obsežne civilizacije, ki bitje Homo Sapiens večkratno prekašajo po marsičem, med drugim po številčnosti. Med civilizacijami z največjimi populacijskimi številkami so mikroorganizmi. Znano je, da je preživetje odvisno od hrane, vode, zraka in prostora, nikoli pa ni bil upoštevan vpliv posameznih vrst na možnost pridobivanja le-teh. V naravi je znanih več vrst, ki imajo zelo kratko življenjsko dobo kot posamezni predstavniki svoje vrste, kot vrsta pa obstajajo znotraj biosfere že zelo dolgo. Klasičen primer so kulture mikrobov, parazitov, ki uničujejo svojega gostitelja in sebe, vendar ne kot vrsto, temveč le kot trenutno kulturo, ki napade gostitelja. To je življenjska zgodba ene izmed mnogih vrst in narava je prevzela skrb za preobrazbo materije znotraj kraljestva življenja. To je stalni sistem preobrazbe materije »od pepela do pepela«, ki ne obstoja zato, da bi človeku dovoljeval prevlado, temveč izvaja/simbolizira kroženje materije znotraj biologije biosfere.

Poglejmo sebe znotraj te vsebine. Prve razpršene naselbine so se pojavile tam, kjer so ljudje imeli na razpolago v izobilju hrane, vode, zraka in prostora; naselbine so cvetele. Ko so se naselbine bolj približale, so se oblikovale kulture in narodi.



Dokler je bilo dovolj hrane, vode, zraka in prostora, so se razvijali; ko pa je hrane, vode, zraka in prostora začelo primanjkovati, so se pričeli vojskovati za njih, ali nazadovati. Tako je končno naša civilizacija postala – v površno dojeti praksi – globalni gospodar planeta Zemlja. Po nekaj tisočletjih je bilo še dovolj hrane (leta 1960), vode (leta 1960) in zraka (na začetku 3. tisočletja) in nekako tudi prostora. Toda na koncu drugega tisočletja ni bilo več dovolj ne hrane, ne vode, ne zraka, le prostora je videti še dovolj, čeprav tudi tega ni več na pretek. Se približuje konec naše civilizacije?

Z vidika naravoslovnih lastnosti planeta Zemlje in ved o njih se približuje in to naglo. Vendar ima vsaka kultura v biologiji svoj čas rojstva, otroštva, odraslosti, starosti in zgodovine. Iz tega se moramo naučiti uskladiti človeštvo z naravo, katere gospodar smo le navidezno in jo moramo kot svoj nadsistem upoštevati, ne le kot svoj pripomoček.

13. Sposobnost uporabe potrebne in zadostne – primerne – celovitosti kot pomembne lastnosti in predpostavke za razumevanje sistema klimatskih/podnebnih sprememb je potrebo še doseči

Dodajmo novost in razvijmo iz nje inovacijo, t.j. po praksi njenih uporabnikov njim koristno novost: ali lahko Homo Sapiens doseže stopnjo razmišljanja in razumevanja, da bi se naučil, kako izključno primerno holistično upravljati naša civilizacijska dejanja, da bi bilo za vse ljudi dovolj hrane, vode, zraka in prostora za življenje. Ta cilj bi lažje dosegli, če bi razmišljali sistemsko in to z uporabo dialektičnega sistema vseh bistvenih vidikov obnašanja, ne sistemsko v pomenu zgolj preciznega opisa s posamičnega vidika (slednje je tudi važno, a ni dovolj, kot je vsak posamičen del npr. avta važen, a sam ni dovolj).

Sistem klimatskih/podnebnih sprememb je sestavni del zemeljske biosfere in ima zapleteno nalogo, da omogoča, zagotavlja, vzdržuje in ohranja osnovne pogoje življenja: temperaturo, vodni cikel, gibanje zrak-voda oceanov in morij, zaščito in kontrolo/regulacijo življenja v biosferi.

Sistem klimatskih/podnebnih sprememb je eden od podsistemov biosfere. Vprašanje je, na katere dele sistema biosfere lahko vpliva naša civilizacija, na kar bomo poskusili odgovoriti.

Življenje biosfere ima mnogo uspešnih sistemov, ki so na različnih stopnjah. Najuspešnejši in najbolj razvit je deževni gozd. Seveda sta razvoj in gospodarjenje z življenjem odvisna od geografskih pogojev, t. j. geografske dolžine, širine in višine okolja in prostora. Poleg teh pogojev je potreben dostop do vode, ki je v mnogih primerih povezan z razvojem biološkega sistema. V mnogih primerih življenje dveh mejnih področij med dvema različnima okoljema, kot so kopno/morje, sladka voda/obala ipd., tvori zelo uspešne sisteme (mangrove, korale, obalna morja, oceanske vode in podobno). Toda večji del biosfere – oceani in morja – so manj raziskani in težje je razumeti vse podrobnosti (okrog 70% zemeljske površine predstavljajo oceani in morja in 97,3% vse vode na Zemlji je v oceanih in morjih).

Splošno znanje biologije nam nakazuje, da so najboljši sistemi na kopnem gozdovi, nato sledijo pašniki, za tem pa biotopi, ki so specializirani glede na lokalne pogoje – močvirja, grmičast svet, makija (Mediterran), gariga, hribi, subarktična, arktična in antarktična področja, reke, jezera, puščave itd. V obalnih vodah oceanov in morij se nahajajo korale, mangrove in še mnogi drugi sistemi, ki spadajo med uspešne sisteme.



Vsi naravni sistemi imajo značilne fizikalne, geografske in biološke lastnosti, ki so osnova za njihovo sestavo, medtem ko sistem klimatskih/podnebnih sprememb zagotavlja osnovne pogoje (voda, zrak, temperatura) za njihov obstoj. Mi lahko raziskujemo preteklost in opazujemo sedanost teh sistemov, ne moremo pa videti prihodnosti evolucije zaradi mnogih vplivov, ki bi se lahko pojavili.

Če govorimo o proizvodnji hrane za našo civilizacijo, sta voda in hrana tesno povezani. Voda je osnovni predpogoj za proizvodnjo hrane. Zaradi sprememb v biosferi je naša civilizacija nadomeščala vodo, ki je bila za proizvodnjo hrane naravno dosegljiva, z vodo iz drugih virov (reke, jezera, umetne akumulacije ipd.). S tem so postala okolja za proizvodnjo hrane zelo podobna umetnim sistemom in se hitro oddaljujejo od prakse biosfere.

Zaradi povečanih potreb po hrani so ljudje vedno nova območja preurejali za proizvodnjo hrane za sebe. Umetni sistemi pridelave hrane so postali stalna dolgoročna praksa (reakcije v biosferi si jemljejo toliko časa, kot ga potrebujejo, kajti narava ima vedno dovolj časa, oziroma: narava se ne ozira na čas). Reakcija je bila vedno bolj omejena proizvodnja in naša civilizacija je bila prisiljena, da izboljšuje tehnologije za proizvodnjo hrane in zaščito (ne pozabimo razlogov in izgovorov za doseganje večjih dobičkov). Iznašli smo mnogo pesticidov in uvajali vedno nove. Enostranskost inovacij je povzročila poškodbe znotraj biosfere, ki so presegle naše razumevanje. Danes je bolje, da sintetičnih kemičnih spojin ne spuščamo v naravne sisteme, ker vsaj dolgoročno delujejo na različne dele naravnih sistemov enostransko in zato škodljivo (onesnaženje vode, dezertifikacija, izguba produktivnosti obdelovalne zemlje itd.).

Tako se zdaj srečujemo z obsežno zastrupitvijo biosfere s pesticidi, ki je posledica premajhne pozornosti na zapletenost naše (edine!) biosfere.

Zaradi vedno večjih potreb naše civilizacije (pitna voda, industrijska poraba vode itd.) in zaradi povečanih potreb kmetijstva in proizvodnje hrane postajajo naravni vodni viri nezadostni. Za reševanje tega problema so uvedli mnogo inovacij, od katerih imajo mnoge nevaren vpliv na sisteme biosfere. Naj omenimo pretirano porabo sladke vode rek in jezer, kar povzroča opustošenje podtalnih zalog vode in zaradi pomanjkljivega znanja tudi fizikalne spremembe sistemov podtalne vode.

Danes smo priča velikemu pomanjkanju virov pitne vode. Zaradi onesnaženja s sintetičnimi kemičnimi spojinami in zaradi njihove dolge razgradnje pa je vprašljiva tudi kvaliteta razpoložljivih virov. Pred kratkim je postal pomemben tudi vpliv hormonov in hormonom podobnih substanc. Danes nimamo čiste pitne vode, temveč le pitno vodo, ki je onesnažena s kemičnimi spojinami in drugimi onesnaževalci v dovoljenih mejah. Če gledamo na razpoložljive vodne vire, naša prihodnost ni obetavna.

Naselbine naše civilizacije so v bližnji preteklosti in sedanosti (zaradi prevelike koncentracije prebivalstva) onesnažile in še onesnažujejo vse vodne vire v lastnih okoljih, vključno z območji, kamor tako onesnažena voda potuje. To je posledica kombiniranega učinka onesnaževanja iz mestnega življenja (številne toksične substance – naravni in sintetični kemični proizvodi itd.), ki vse končuje v vodah izpustov iz individualnih kuhinjskih korit, stranišč in sistemov odpadnih voda in iz »naravnih« rečnih tokov.



Po drugi strani kmetijstvo zastruplja zemljo in podtalnico ter posledično vodotoke, ki so povezani z zastrupljeno zemljo in podtalnico. Končno se vse skupaj konča v priobalnem morju in oceanskih vodah, ki se nahajajo v različnih stopnjah onesnaženosti ali zastrupitve.

Naša civilizacija uporablja reke kot transportne sisteme za odpadke. Da bi zaščitili človekova naselja, njegovo lastnino in civilizacijske dosežke pred poplavami, so zgradili obsežne vodne gradnje. Dejansko smo s tem naravi enostransko vsilili naše civilizacijske standarde in zožili naravne rečne tokove ter s tem porušili naravne biološke filtracijske sisteme rečnih voda. Dosegli smo hiter odtok rečnih voda, vendar samo to, kajti zaščite civilizacijskih naselij s tem nismo dosegli. Dolgoročno so poplave še vedno tu, le da so mnogo bolj uničevalne. Večina rek potrebuje ekoremediacijo svojih naravnih sposobnosti za življenje, ker jih je naša civilizacija uničila.

Drugo območje s podobno usodo zadeva estuarije in priobalne vode, ki so jih v mnogih primerih spremenili v poslovne, turistične in nastanitvene kapacitete z nikakršnimi ali zelo slabimi pogoji za življenje biosfere. Odpirajo nove možnosti onesnaževanja priobalnih voda in posledično oceanov in morij.

Danes večji del človeške populacije kot kdajkoli prej živi v priobalnem pasu in je stalen vir onesnaževanja priobalnih voda. Kmalu bomo lahko brali o rezultatih stalnega človeškega uničevanja morskih in oceanskih voda.

Na osnovi podatkov, ki smo jih strnili tukaj, lahko zaključimo, da bi mnogo posameznikov in organizacij moralo začeti razmišljati holistično, uporabljati dialektični sistem vseh bistvenih vidikov v obliki multi, inter in supradisciplinarnega ustvarjalnega sodelovanja. Tako pretekle, kot sedanje izkušnje vplivov naše civilizacije na mnoge naravne sisteme terjajo učinkovitejšo zaščito 'naše' narave, prostora in okolja – v našo človeško korist.

Holistično razmišljanje bi moralo zajeti celotno človeško ravnanje/obnašanje, da bi naša civilizacija prevzela dolgoročno odgovornost zase in raje zaščitila naravo naše Zemlje kot doživela globalno tragedijo človeštva, kakršno povzroča s svojo sedanjo enostranskostjo.

Sistem klimatskih/podnebnih sprememb deluje ob predpogojih dinamične evolucije fizike, geografije in biologije Zemlje in njenega okolja. Človeštvo je s svojim načinom življenja v zadnjih 300 letih industrijske in postindustrijske civilizacije dokazalo svoje sposobnosti za konstruktivno in destruktivno delovanje na svoje naravno okolje. Pri tem je prestopilo mejo trajnostnega/sonaravnega življenja in dolgoročnega vpliva na biosfero planeta Zemlje. Naše ugotovitve, navedene v knjigi »Sistemsko razmišljanje in sistem klimatskih sprememb«, 2002 (v angleščini) kažejo, da so vplivi človeka na sistem biosfere planeta Zemlja individualni in organizacijski in da so tudi posledice individualne, lokalne, organizacijske, regionalne, nacionalne, internacionalne, kontinentalne, globalne in mogoče tudi univerzalne. Glavni problem je, kako bi dosegli večjo in bolj celovito odgovornost ljudi. To zahteva odločnejše politične ukrepe v to smer.

Sistem klimatskih/podnebnih spremembe, kot integralni del zemeljske biosfere, ni samo njen ustvarjalec, marveč omogoča, zagotavlja, vzdržuje in ohranja v njej pogoje za življenje. Človeštvo mora poiskati nove poti za trajnostno/sonaravno prihodnost, ki bo vsebovala nova medsebojna razmerja med našo civilizacijo in planetom Zemlja.



Znanost, raziskave in evolucija, družba in vse vladajoče, ekonomske, nacionalne in mednarodne institucije morajo sprejeti širši celovitejši pogled na obstoj naše biosfere in njemu ustrezno odgovoriti na nove izzive mnogo celoviteje kot doslej, vključno z mnogo več upoštevanja posrednih učinkov, saj se le-ti pogosto izkažejo na srednji ali vsaj daljši rok, če že ne takoj, za zelo nevarne in zato osrednje posledice. Le-te je treba v največji možni meri preprečiti pravočasno, da se ne nakopičijo v skoraj nerešljivih količinah, kot grozijo zdaj.

Sedanje onesnaženje na globalni ravni (nuklearne tehnologije, CFC-ji in slične substance, pesticidi, genetske modifikacije, hormonom slične sintetične kemijske spojine, tehnološki vplivi, kot so motorji z notranjim izgorevanjem, transportna sredstva, orožje, vpliv PCB-jev na genetsko strukturo, komunikacijske in energetske žične in brezžične tehnike, itd.) odseva človeško kratkovidno razmišljanje in delovanje. Zato potrebujemo za našo trajnostno/sonaravno prihodnost dolgoročno odgovornost vsakega človeka in naše civilizacije do biosfere – okolja, v katerem živimo, dokler nam okolje to omogoča.

Pri tem moramo razlikovati vplive gospodarja naše civilizacije – profitnega motiva – od njegovega razumevanja in škodo, povzročeno zaradi pomanjkanja znanja in holizma. V mnogih primerih globalnega onesnaževanja je bil profitni motiv glavni vzrok za obsežno onesnaženje. PCB-je, CFC-je, pesticide in druge substance so proizvajali in jih še proizvajajo in uporabljajo in tržijo kot izboljšave, čeprav povzročajo škodo znotraj našega lastnega življenjskega prostora in okolja. Globalno segrevanje, tanjšanje ozonskega zaščitnega plašča so primeri pomanjkanja kakršnekoli odgovornosti naše civilizacije. Tem lahko prištejemo tudi eksplozivno reprodukcijo človeštva in onesnaževanje atmosfere. Profitni motiv tako povzroča – pogosto in v celoti gledano ogromne – stroške namesto profita, a z ozkim in kratkoročnim pogledom namesto primerno celovitega mnogi tega niti ne opazijo.

Potrebujemo raziskovanje in razumevanje, katerega namen bo dolgoročna odgovornost naše civilizacije in preprečevanje neodgovornega obnašanja sedanjih voditeljev, človeštva in izumov naše civilizacije, kot je enostranski profitni sistem, saj onemogočajo razumevanje dolgoročne odgovornosti. S tem povzročajo neodgovornost in njene hude posledice za vse nas.

Trenutno stanje biosfere, narave, prostora in okolja, kakor tudi znanstvene raziskave ter naš socialni/družbeni sistem vodijo našo civilizacijo v slepo ulico. Individualni, regionalni, nacionalni in internacionalni interesi zaradi družbenih, finančnih, političnih in birokratskih pritiskov, filozofije vojne kot enostranskega in zato navideznega razreševanja problemov, pomanjkanja spoštovanja med ljudmi ipd. ne dopuščajo novega primerno celovitega pristopa k vprašanju preživetja. Zato je preživetje sedanje civilizacije človeštva zelo vprašljivo.

Mi, prebivalci Zemlje, moramo doumeti potrebo po primerni celovitosti, kar bi podprlo ustanovitev svetovne ustave, svetovnega parlamenta in svetovne vlade. Če bi delovali ti organi pošteno, torej s primerno celovitostjo in družbeno odgovornostjo, ne pa kot lutke enostranskega kapitala, bi človeštvo, vključno s tem kapitalom, imelo možnosti za preživetje z možnostjo uskladiti socialna vprašanja in potrebe celotnega človeštva z naravnimi možnostmi, možnostmi prostora in okolja planeta Zemlja. Po znanih podatkih sedaj živi 85% človeštva z manj kot šest US dolarji na dan, ena milijarda ljudi celo z manj kot enim dolarjem na dan, stroški za zdravljenje ljudi in obnovo njihovih naravnih pogojev za obstoj, stroški za bolj ali manj nepotrebno prevažanje ogromnih količin dobrin na tisoče kilometrov daleč v imenu nesmiselne pravice do neomejene izbire namesto domače hrane itd. pa stalno naraščajo.



Sedanje navade na Zemlji, kot so:

- uničevanje skoraj vseh voda s sintetičnimi kemikalijami,
- onesnaženje zraka s kopnim, pomorskim in zračnim prometom,
- uničenje zaradi vojn,
- uničevanje ozonskega zaščitnega plašča,
- uničevanje plodnosti zemlje zaradi prakse v kmetijstvu, vključno s pojavom novih puščav in uničevanjem deževnega gozda,
- globalno segrevanje in seveda
- eksplozivna reprodukcija človeštva,

se ne morejo reševati z upoštevanjem tako imenovanih nacionalnih in drugih ozkih interesov. Morali bi biti glavna odgovornost svetovne vlade.

Sistem klimatskih/podnebnih sprememb, ki omogoča, zagotavlja, vzdržuje in ohranja pogoje za življenje znotraj biosfere, potrebuje poseben, primerno celovit, in zato interdisciplinaren znanstveni pristop in akcijo svetovnega obsega. Zaščita narave, prostora in okolja, ki naj bi skrbela za biosfero, ravno tako zahteva posebne znanstvene raziskave in akcijo celotnega človeštva. Oboje predstavlja globalne sisteme, ki reagirajo na enostranske dejavnosti človeštva z globalnim razpadom in zato zahtevajo ukrepanje celotnega človeštva, a primerno celovitostjo.

Zaradi preobremenjenosti znanstvenikov z vojaškimi temami in zaradi zahtev politike in birokracije žal obstoječe kapacitete znanstvenega in raziskovalnega, pa tudi »razvojnega« dela ne zadoščajo za potrebne inovacije dane prakse. Potreben je nov pristop za preusmeritev znanstvenega dela v pridobitev potrebnega znanja in vrednot za ohranitev narave in okolja, vključno s sistemom klimatskih ali podnebnih sprememb. Sicer ljudje ne bomo preživeli, vsaj ne v obliki današnje civilizacije.

14. Potrebna in zadostna – primerna – celovitost kot možnost izhoda iz današnje slepe ulice

Znanstveno delo je osnova za pridobitev potrebnega znanja. Zahteva posebno koordinacijo na svetovni ravni, da bi doseglo primerno celovitost, in bi moralo biti sestavni del svetovnega upravljanja. Potrebujemo neodvisne znanstvenike, ki bodo delali zaradi svojih sposobnosti in ne zaradi potrebe po dnevni/mesečni/letni plači, ki jo jim zagotavljata birokracija (tako imenovan 'demokratski' socialni finančni sistem), potreba po vojaških sredstvih ali profitno usmerjena ekonomija. Današnji denarni sistem je postal sam svoj gospodar, pošast, ki vlada celotni civilizaciji. Lepo bi bilo, če bi ga lahko spravili nazaj v okvir, kamor spada, t.j. med služabnike človeštva. Sedaj profit ubija profit, ker povzroča odločilne stranske učinke, vključno s stroški človeštva, ki so vključeni v davke, ali pa se kopičijo nepokriti, tako da segajo v tisoče milijard dolarjev ali evrov. Kolateralne izgube so ogromne škode na sistemih narave in posledično tudi za našo civilizacijo.

Da bi lahko razumeli potrebo po svetovnem in to primerno celovitem odločanju in drugih vsebinah obnašanja, torej po svetovnem parlamentu, bi morali ljudje razumeti sisteme, v okviru katerih živimo in ki jih sami kreiramo. To je pomembno zaradi tega, ker bo katerikoli



sistem v naravi ostal tak, kot je, dokler vsi sistemi in razmerja znotraj njih delujejo usklajeno. Skupaj tvorijo sistem, ki poskuša biti prijazen za življenje. Če se katerikoli večji ali manjši del sistema premakne ali spremeni, se bo začel gibati oziroma spreminjati celoten sistem. Nemogoče je napovedati, v katero smer se bo sistem gibal oziroma spreminjal. To se dogaja s sistemom klimatskih/podnebnih sprememb danes.

Končno lahko sistem klimatskih/podnebnih sprememb tako spremeni življenjske pogoje znotraj biosfere in geografijo Zemlje, da bo konec naše civilizacije. Zato

15. Priporočam

Da si ogledate »Priporočilo« ob koncu »Zaključka«

16. Zaključek

V zaključki podajam predstavitev filozofije trajnostne sonaravne prihodnosti človeštva, ki sem jo pripravil v novembru 2009¹³.

Povzetek:

Filozofija trajnostne sonaravne prihodnosti človeštva predstavlja iskanje znanja in spoznavanja narave in pomena vesolja oziroma življenja. Znanje je največji dosežek sedanje civilizacije Homo Sapiensa.

Delovanje sistema klimatskih sprememb v območju biosfere Zemlje vse močneje spreminja pogoje življenja. Mislim, da je potrebno doseči dogovor med ljudmi, ki naj bi omogočili trajnostno sonaravno prihodnost človeštva v pogojih velikih sprememb, kakor v globalni človeški skupnosti, kot v življenjskem okolju oziroma biosferi.

Družbena ureditev, naloge in odgovornosti v njej potrebujejo prenovo, ki naj bi omogočila prehod sedanjega človeštva v jutrišnje trajnostno sonaravno človeštvo tretjega tisočletja.

Za uspešno spremembo bi bilo prav, da se spremenijo sedanje navade v izobraževanju in šolstvu, vsebini in etiki medsebojnih odnosov ljudi, medsebojnem spoštovanju, in odnosu do narave, ki naj bi bile osnova za dolgoročno preživetje globalne človeške skupnosti.

V diskusiji podajam sodoben znanstveni pristop ugotavljanja in možnega usmerjanja delovanja ter akcije za lajšanje krize družbe in narave. Koncem leta 2009 ugotavljam, da se globalna človeška skupnost srečuje z družbeno krizo na področjih: energije, pitne vode, prehrane, kreditov, družbenih odnosov in medsebojnega spoštovanja. Za nameček je tu še kriza narave, natančneje, spreminjanje pogojev življenja v biosferi zaradi delovanja sistema klimatskih sprememb.

¹³ Opravičujem se bralcem na možnih podvajanjih misli in rezultatov, ki so posledica želje do selostne vsebine.



Spremembe biosfere zaradi delovanja sistema klimatskih sprememb lahko dolgoročno spremenijo geografijo, biologijo in življenjske pogoje od za človeštvo primernih, kot so bile zadnjih 14.000 letih, do za človeštvo neprimernih pogojev.

Tako se sedanja kriza energije, pitne vode, hrane, kreditov in družbe še dodatno zapleta s krizo v biosferi Zemlje. V letu 2009 se začenjajo težji časi za svetovno človeško skupnost.

Družbena odgovornost korporacij in družbena odgovornost posameznika (3.1., 3.3., 79.) je del sedanje družbe, ki bi lahko imel veliko večji pomen, kot se sedaj misli.

Možnosti preživetja svetovne človeške skupnosti se lahko povečajo z uvajanjem družbene tehnologije »trajnostne sonaravne prihodnosti človeštva« kot nadgradnje sedanjega trajnostnega sonaravnega razvoja. To bi omogočilo večjo harmonijo življenja ljudi z naravo, kar je predpogoj preživetja in dolgoročnega sodelovanja ljudi ter narave Zemlje¹⁴ oziroma biosfere ali dela, v katerem se nahaja »živa narava« in sedanja svetovna človeška skupnost.

S pospeševanjem globalne družbene odgovornosti posameznikov bi bilo možno doseči premik v odnosu človeštva do narave in tako omogočiti nov veliki dosežek prehoda iz sedanje krize energije, pitne vode, hrane, kreditov, družbenih odnosov in biosfere, v trajnostno sonaravno prihodnost človeštva.

Trajnostna sonaravna prihodnost globalne človeške skupnosti ali harmonija naše civilizacije z naravo planeta Zemlja je opcija, da globalna človeška skupnost doseže dolgoročne možnosti preživetja na Zemlji (3., 3.1., 3.2., 3.3.).

Ključne besede:

Družbena odgovornost posameznikov in korporacij, filozofija, globalizacija, narava planeta Zemlja, naš skupni neprijatelj, naša civilizacija, novi pristop, sistem klimatskih sprememb, sistemsko razmišljanje, analiza in sinteza, sonaravna trajnostna prihodnost človeštva, svetovna vlada, parlament in ustava, svetovna kriza energije, pitne vode, hrane, kreditov, družbe, in narave.

Diskusija:

Koncem leta 2008 se je pokazala realnost svetovne krize družbe globalne človeške skupnosti. K temu je pripomogla slaba administracija ZDA v razdobju 2000 – 2008. Kriza družbe ZDA in ostalih držav po svetu je dobila globalno razsežnost.¹⁵

Malo ljudi se zaveda zapletenosti sedanjega položaja človeške svetovne/globalne skupnosti glede sedanjih in v prihodnje prisotnih kriznih vsebinah: krizi surovin, energije, pitne vode, hrane, kreditov, družbe, etike in spoštovanja med ljudmi se prišteva še kriza življenjskih pogojev v biosferi zaradi delovanja sistema klimatskih sprememb.

Mislim, da sem naštel glavne probleme v letu 2009 in v prihodnje.

¹⁴ Prosimo pogledite: Ećimović in drugi: The Sustainable (Development) Future of Mankind, 2007, na www.institut-climatechange.si; ter Božičnik, Ećimović, Mulej in drugi: Sustainable Future, Requisite Holism, and Social Responsibility, 2008, ravnotako na domači stranici www.institut-climatechange.si.

¹⁵ Prosimo pogledite: Planck Foundation (www.planck.org): Global Future Analysis, 2008, ISBN 978-94-6012-001-5, in Global Resources Analysis od Induscorp, NL; e-mail: volume1@indiscorp.nl



Stanje globalne človeške skupnosti je kvalitetno obdelano v dveh predstavitev in sicer:

- Global Future Analysis 2008 Analiza prihodnosti sveta, dokumentu Planck Foundation - sklada www.planck.org , in
- Global Resources Analysis osnutku 2008 Analiza virov sveta, osnutku dokumenta Induscorp.nl objavljeni na volume1@induscorp.nl

Obe analizi so delali odlični strokovnjaki večinoma družboslovci, ki so izjemno prikazali stanje globalne človeške skupnosti. Mislim, da je tem analizam potrebno dodati še spremembe v biosferi in njihove vzroke.

Manjkajoči del je delovanje sistema klimatskih sprememb in posledične spremembe v biosferi (0. – 3.3., 12. - 14, 38., 41., 45.), kar, mislim, da bo povzročalo resne probleme za preživetje ljudi.

Skupina entuziastov in filantropov je pred veliko leti začela delo na odpiranju možnosti vodenja svetovne človeške skupnosti v smislu svetovne vlade, parlamenta, in ustave v pogojih direktne demokracije (1. - 3.3., 58.). Veliko je bilo narejenega, vendar je še dolga pot pred nami.

Trajnostna sonaravna prihodnost človeštva (3. - 3.3.).

Mislim, da trajnostna sonaravna prihodnost človeštva v smislu vsebinske družbene ali socialne tehnike kot nadgradnje trajnostnega sonaravnega razvoja, daje možnosti in je lahko podlaga za optimizem.¹⁶ Za uresničevanje tranzicije globalne človeške skupnosti potrebujemo integralno kompleksno razmišljanje in sodelovanje vseh subjektov (0. – 3.3., 32., 34.- 35., 43., 46., 48., 50., 62., 75., 76., 78.).

Globalizacijska doba, ki je pred nami, ima svoje zelo zapletene vsebine, ne glede na to, ali jih ljudje vidimo in poznamo. Tako nas med drugim čaka reševanje krize 2008 in 2009 ter istočasno ugotavljanje stvarnega naravnega okvirja našega okolja (človeškega okolja) znotraj biosfere Zemlje.

H kompleksnosti situacije dodaja svoj delež še predvidevanje novih zapletov, ki imajo lahko osnove v obeh delih, v človeškem okolju in biosferi ter sinergističnih učinkih (3.-3.3., 78.).

In

Življenje in obstoj moderne človeške družbe je soodvisen od življenjskih pogojev, ki jih omogoča narava in njen integralni del sistem klimatskih sprememb.

Narava, vesolje, kozmos, naša galaksija, sončni sistem, naš planet Zemlja, biosfera, klima in sistem klimatskih sprememb niso enostavni sistemi (mentalne predstave, vsebine ali procesi), ampak so zelo zapleteni (3.3.).

Sistem klimatskih sprememb z lastnim obstojem/delovanjem omogoča, zagotavlja, vzdržuje in ohranja življenjske pogoje v biosferi Zemlje. Vsebine sistema klimatskih sprememb so po

¹⁶ Prosim poglejte podpis 2.



poreklu naravnega izvora ali povzročene s strani človeške skupnosti. Obe zvrsti vsebin lahko spremenita potek dogodkov/delovanja sistema, in so lahko po človeških kriterijih pozitivne ali negativne (0. – 3,3.).

Filozofija trajnostne sonaravne prihodnosti človeštva je iskanje znanja in razumevanja narave ter pomena vesolja in življenja (3.3.).

Vse moje raziskave in znanje ter raziskave skupaj s sodelavci nakazujejo, da je harmonija človeške skupnosti z biosfero Zemlje edini način, za obstoj človeštva na Zemlji. To je moja vizija trajnostne sonaravne prihodnosti človeštva (0. – 3.3.).

Za prihodnost potrebujemo skupno delo vseh ljudi človeške skupnosti, ker vem, da z nobeno količino denarja ni mogoče kupiti prihodnosti. Naše osnovno sredstvo ni denar, ampak delo nas samih.

Predlagam, da se vrnemo nekoliko nazaj pa do sedanjosti in pogledamo dogajanja v drugi polovici dvajsetega stoletja.

Razmišljanja, podobna tem v tej prezentaciji, imajo korenine v ozaveščanju človeštva v šestdesetih letih prejšnjega stoletja o potrebni kvaliteti naravnega okolja biosfere, ki so osnova »žive narave« in človeštva na Zemlji. To je čas rojevanja družbene tehnologije, strategije, vizije trajnostnega razvoja (50).

Začetno ozaveščanje človeštva o prihajajočih težavah je bilo izredno dobro, vendar ni spremenilo kratkoročnih ciljev ljudi. Mislim, da so zapleteni problemi trajnostnega razvoja ali prihodnosti in biosfere Zemlje veliko bolj kompleksi, kot so mislili ljudje ob koncu dvajsetega stoletja.

Prvi del pojma »trajnostni razvoj« (0. – 3.3., 4. – 13., 15. – 40., 43., 46., 48., 50., 56. – 57., 62. – 75., 75.) – »trajnostno, sonaravno« ima pojmovno večjo vrednost za prihodnost človeštva. Drugi del »razvoj« je pojmovno vezan na industrijsko revolucijo, gospodarjenje in poslovanje ter v resnici nima povezave ali pomena za razumevanje narave.

Kadar uporabljamo termin »razvoj«, mislimo na proizvod, tehnologijo, delovni proces, sisteme kot proizvode človeštva (avtomobili, letala, čolni, orožja, stroji in ostale podobne vsebine).

»Razvoj« je del človeške družbe poindustrijskega časa. Narava, biosfera ne pozna pojma »razvoj« in nima kakršnega koli razvoja. Narava deluje po vsebinah in v povezavi z **medsebojno odvisnostjo, medsebojnim delovanjem in sodelovanjem**¹⁷ ter se vedno nahaja v sedanjem času.¹⁸

Mislim, da sedaj potrebujemo »novi pristop«¹⁹ (57.), ki naj bi omogočil urejanje odnosov človeške skupnosti, uvajanje sistema novih vrednosti, etike, vsebin in mehanizmov, ki naj bi

¹⁷ *Interdependence, interaction and co-operation* kot stalna gonilna sila narave je obdelana v knjigi »System Thinking and Climate Change System«, prosim pogledaj na: www.institut-climatechange.si.

¹⁸ »System Thinking and Climate Change System – Against a big »Tragedy of Commons« of all of us«, 2002, Ećimović. Majur, Mulej in »The Information Theory of Nature, and«, 2006, Ećimović, odpirajo razmišljanja za spoznavanje sedanjosti in naše civilizacije v tem prispevku.

¹⁹ »Novi pristop«, ki izhaja iz potrebe po prestrukturiranju svetovne družbe je delo prof. dr. Slavka Kulića, IOM, iz Zagreba in se še vedno nahaja v znanstvenih krogih ter čaka na uporabo v družbi.



omogočili prehod svetovne človeške skupnosti v trajnostno sonaravno svetovno družbo prihodnosti.

Priporočam, da se koncept, družbena tehnologija, vizija trajnostne sonaravne prihodnosti človeštva uvaja kot harmonija človeštva z biosfero Zemlje. Na tej poti naj bi premagali sedanjo izgubljeno povezavo med mestnim prebivalstvom in biosfero zemlje.

Trajnostna sonaravna prihodnost lokalnih skupnosti vodi v trajnostno sonaravno prihodnost človeštva (3.-3.3.).

Bilo bi enostavno dolgoveziti o »trajnostnem razvoju« kot družbeni tehnologiji/konceptu, vendar to ni namen te prezentacije. Naša naloga je, da omogočimo prehod iz »trajnostnega razvoja« v »trajnostno sonaravno prihodnost« človeštva.

To priporočam kot možnost preživetja človeštva v biosferi Zemlje.

Evolucija od »trajnostnega razvoja« v »trajnostno sonaravno prihodnost« človeštva naj bi bil proces, pri katerem bi sodelovalo celotno prebivalstvo človeške skupnosti. Prilagajanje prihajajočim življenjskim pogojem v biosferi bi sledilo.²⁰ Prehod v trajnostno sonaravno človeštvo prihodnosti je najbolj zapleten cilj, ki si ga lahko zada človeštvo, vendar le v soglasju vseh ljudi svetovne skupnosti (3.3.).

Mislim, da je prav, da tukaj ponovno navedem kratko definicijo **trajnostne sonaravne prihodnosti človeštva, ki naj bi bila harmonija in sožitje sistema svetovne človeške skupnosti in sistema biosfere Zemlje.**

Izhodišča, delo in rezultati iz vsebine trajnostnega razvoja so prava osnova za prehod iz družbene tehnologije trajnostnega razvoja v družbeni proces v trajnostno sonaravno prihodnost.

Številne pomembne vsebine so bile omenjene v tej prezentaciji in mislim, da ne smemo prezreti, da še veliko več pomembnih vsebin ni bilo omenjenih. Vsekakor je pomembno, da spoznamo in ne spregledamo ne enostavnih, ne zapletenih vsebin, ki so v celoti del trajnostne sonaravne prihodnosti (0. – 3.3.).

Ljudje, vrednosti, znanje in dediščina človeštva je kot epska pesnitev, ki je bila začeta ob nastanku človeštva in se še danes dograjuje. Tej je zelo podobna narava od osnovnega okolja – vesolja oziroma kozmosa pa nadalje galaksij, osončij in planetov ter vseh ostalih znanih in še neznanih oblik energije in materije (3.3.).

Tem sledijo vsebine osnovnih delcev, kvarkov, protonov, nevtronov, elektronov, teorije relativnosti, informacijske in okoljske teorije narave, strukture atomov in ostalih pomembnih vsebin narave.

Mi ljudje smo del narave, vendar vse premalo je to del našega zavedanja in vedenja v dobi globalizacije in pred njo v obdobju zadnjih sto let (3.3.).

Sistem klimatskih sprememb lahko povzroči, da se življenjski pogoji spremenijo toliko, da ne bo mogoč obstoj ljudi v biosferi.

²⁰ Prosim pogledjte knjigo: »Our common Enemy – The Climate Change System Threat« na: www.institut-climatechange.si.



To se je že dogodilo v preteklosti – ledene dobe itd. Zato sem predstavil sistem klimatskih sprememb kot našega skupnega neprijatelja ter trajnostno sonaravno prihodnost človeštva kot mogočo pot za ohranitev naših zanamcev v biosferi Zemlje (0. – 3.3.), in

17. Priporočam²¹

En planet ena vlada je prvo priporočilo. To pomeni od Ustave federacije planeta Zemlja, parlamenta in vlade, ki jo je potrebno predhodno ratificirati.

Drugo priporočilo je novi pristop k urejanju družbenih odnosov ljudi, ki naj bi upošteval vse dosedanje izkušnje o sožitju ljudi in širše biosfere Zemlje. Med cilji so ustavitev eksplozivne rasti števila ljudi v svetovni skupnosti, upoštevanje potrebnih etičnih osnov, spoštovanja med ljudmi, upoštevanje skupnih zakonov, šolstva in vzgoje, ter z modrim vladanjem omogočiti našim zanamcem trajnostno sonaravno prihodnost v biosferi planeta Zemlja.

In tretje priporočam preusmeritev znanstveno-raziskovalnega dela od inovacij na področju sredstev za množično uničevanje ljudi in orožja, ozko naravnanih marketinških, komercialnih, denarno usmerjenih tehnologij proizvodnje energije, hrane, pitne vode, tehničnih in drugih vsebin v smeri razvoja poznavanja osnovnega okolja – vesolja, narave in nujno potrebnih vsebin za ustvaritev ciljev prehoda svetovne družbe v trajnostno sonaravno družbo prihodnosti.

V zaključku navajam »Bodi sprememba, katero želiš videti v svetu« (”Be the change you want to see in the world” Gandhi).

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1. Executive Foreword by: H. E., Baron, Col. Chev., Acad., Brig. Gen.(R) Prof. Dr. Roger Haw Boon Hong

In this book, Prof. Dr. Dr. h.c. Timi Ecimovic has provided an amazingly comprehensive overview of the important processes for the three system thinking applications which consists of Environment Theory of the Nature, The Information Theory of the Nature, and The Climate Change System Introduction.

Each single word, theory, concept, idea, mission, vision, calculation, methodology and even solution is derived from his hard work cum passion of putting huge interest and great effort on the research studies in this particular field of subject through countless of hours since 1980.

The main-line of argument in his research works are to demonstrate the scientific activity field in the Environmental Sciences both technology and theory. The significance of the argumentation consists in the fact that theories of personality are notoriously ungrounded in Theory of Knowledge. The signal contribution however, is only a part of the research work. In the process of developing his argument, Prof. Dr. Ecimovics' drawing upon his specialized knowledge of the scientific activity field in the Information Theory of Nature processes both technical and theory, devised a simulacrum of the mind which serves the shed light both on effective and productive stages. Although, the project works main line of argument could stand alone independently of the simulacrum discussion, from a logical point of view modeling, and is several degrees of abstraction above existing models.

He has contributed his great talent in the Environmental Sciences in the area of Climate Change System by his development of the equation and The Information Theory of Nature processes and its applications, particularly the equation for the information theory based on the proper protective mechanism of the System Theory, System Thinking, analysis and synthesis and Climate change system as processes within the Nature, when holistic thinking at all levels and dimensions could be assistant to the science. This book will illustrate the knowhow of this subject matter.

In line with this topic, the base of the applications of The Information Theory of Nature processes developed by him from holistic system thinking and the climate change system as in the book "System Thinking and Climate Change System (Against a Big "Tragedy of Commons" of all of us)" 2002, and book "Our Common Enemy - The Climate Change Threat" 2006 to its recent unavoidable position in the field of the holistic thinking and Environmental sciences and first Chapter of the book of Physic's Prof. Dr. Timi Ecimovic has made great contributions with excellent results to mankind in the physics and environmental sciences, production technologies, research methodologies and, especially in the Information theory of Nature. In the last field of activity, his Information theory of Nature is now the new platform for evolution of the sciences.

Indeed he has made a significant positive contribution to mankind, culture and leadership, one which has been highly acknowledged by many international institutions, associations and organizations globally.

It is hoped this book will be useful for policy makers, national planners, administrators, all field of scientists and experts, universities, Companies and individual at large. The non-



government organization can play a great role in creating awareness about Environment Theory of the Nature, The Information Theory of the Nature, and the Climate Change System through publicising the contents of the book. There are elements in this book which illustrated many lessons here for all countries, both rich and poor. Now is high time to promote a green world to prevent 'end of the world disaster' coming to us too soon beyond our expectation.

Life is full of adventures and thrills. Be appreciative and thankful because things in this world may not last forever. Also be responsible and take care of our environment for the benefit of society at large. Although things may change gradually or as a result of an external force or a sudden natural disaster, humans have managed to learn numerous big lessons from all kinds of natural disasters and manmade problems. Therefore, it is everyone's duty to protect the Earth and love all the living, instead of purposely destroying life. We may leave behind each other one day. However we should value every single second and everything surrounding us whether be it near or far away.

This book is an excellent piece of document written by Prof. Dr. Timi Ecimovic, Programme Director for Ansted University School of Environmental Sciences. His brilliant research works merit special attention as he has shown us the nature reaction brings climate change issues.

Brief profile of Prof. Dr. Roger Haw Boon Hong



Professor Dr. Roger Haw Boon Hong (Malaysian) is a well-respected international academician, institution and organization developer, visionary leader cum sustainability expert. Professor Haw has demonstrated a visionary commitment to Corporate Social Responsibility (CSR) Practices, Education and Environmental Sciences Development activities. He has co-authored several books and research papers in the areas of CSR, Business Management, Education, Environmental Sciences, Learning Organizations, Culture and peace, and Distance/Virtual Learning Programs which were published by various publishers in the UK, Canada, European Countries, USA, Middle East, Africa, India, Korea, Thailand, and Malaysia, etc. Prof. Roger Haw has obtained over 100 local and international prestigious awards recognition in different disciplines. He is a holder of seven Honorary Doctorate degrees from various Universities and also obtained 18 Fellowship from different Professional bodies in various countries. As an Ambassador for his profession he has given his time and expertise to twelve reputable institutions in twelve countries of which he is serving as an Honorary Member of the Academic Board of Advisors and Board of Governors.

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2. Executive summary²²

The vision of the sustainable future of humankind has a magic power, because it is presenting the Nature and humankind not as separate issues, systems, requiailtely holistic approach, but it is letting us know how we have come to the present, what the present is, and what shall we be in the future.

The environment theory of the Nature is opening new frontiers for understanding present and the Nature.

The information theory of the Nature makes possibility for understanding of systems, processes and reasons for what we are.

The term system has many contents. Here it will mean to us neither the mental picture about the event or process dealt with nor a usual method of neither work, nor a socio-economic or other order nor a network/complex of plants or stones or humans fitting together somehow.

The term system will here rather mean to us a feature/event/process that is so complex in its components, relations and influences between them and their consequences that it is difficult to comprehend and even more difficult to control.

This is why I call the climate change a system.

Understanding and/or controlling it per parts is not very helpful, because as a whole a system has attributes that differ essentially from attributes of each one of its parts alone. Clear cases: the edible salt is a synergy/system of two poisons; water is a synergy/system of two gases; an organization is a synergy/system of many – different from each other, unavoidably, and hence complementary – professionals; a house is a synergy/system of bricks/concrete/wood, doors, windows, electric, water and other installations etc.

Synergies emerging from their attributes provide to the new whole/system new attributes. Therefore, the truth will be easier to discover, and difficulties and development easier to control, if the feature/event/process is considered as holistically as possible rather than per single parts. This is called systemic or systems thinking. A total holism of human behavior, i.e. monitoring, perception, thinking, emotional and spiritual life, decision making and action, and a total wholeness of insights and outcomes, is usually impossible to attain, but a single specialization – a single viewpoint of profession – limits humans to fictitious holism providing for fictitious wholeness.

This fact makes us apply the Mulej/Kajzer (1998) law of requisite holism as the suitable one. In the case of the climate change system this would mean the understanding that synergies of insights from physics, chemistry, biology, history, technology, economy and several more disciplines and practices are needed. One would chose and collect professions and viewpoints that one would consider essential and interdependent for mutual completing up by differences.

²² From the book »The Climate Change System Introduction«, Ecimovic, Timi, and Mulej, Matjaz, October 2008, ISBN 978-961-91826-5-9



Following the ancient Greek philosophy one would link them on the basis of their interdependence or – in the Greek wording – dialectics. A dialectical system would show up (Mulej, 1974, see Mulej 2008). In this case a system is not meant to be a complex feature, but a mental picture about it, which we introduce in order to attain the requisite holism of human behavior and requisite wholeness of its outcomes.

A systemic approach to the climate change must consider “The Age of Globalization”, the present status of our civilization, unnatural life of humans in poly/mega and similar urban centers, management of technologies without sustainability, lack of individual and corporate social responsibility²³, uncontrollable human-population explosion, short- and often medium- and even long-term ('side'-)effects of the: synthetic chemicals; modern technologies, weapons, combustion engines, transport system, nuclear technologies, industrial and agricultural production, national and international political distribution of power and administration, and their influences on the scientific global, national and local communities; they are causing a gap between needs and results of the cohabitation of Homo-sapiens-civilization with the nature on the planet Earth.

This gap threatens this civilization to disappear.

This gap surfaces as the climate change system and global human community impacts, and consequences are: strong winds, large droughts and floods, tsunamis, earthquakes, large air pollutions by industrial, city life's and transport system's emissions, changes in local climatic patterns, global warming, depletion of the ozone layer, pollution of all three basic parts of the biosphere: soil, seas/oceans and air.

They are due to huge misunderstanding of the climate change system by the population in local communities around the Globe.

Simple language for simple people and understandable explanations are needed for sustainable future of mankind or harmony of humankind civilization with the nature on the planet Earth.

It is as it is; we are, at least, trying to present the contemporary scientific approach to the present most important issue of humankind.

Whether we shall understand the climate change system or not has a crucial importance for the local community life, and gives questionable chances to the long-term of survival of humankind – it requires sustainable future. Sustainability of local communities leads to the sustainable future of global human civilization²⁴.

²³ Social responsibility is an attribute of humans and their organizations. It prevents or diminishes, at least, the danger of humans' abuse of their influence leading to damage experienced by their coworkers, other business or personal partners, broader society or nature on which the human existence or quality of life, at least, depend. This is a short summary of definitions in international official documents. Other references see in social responsibility an upgrading of the innovation effort/support called improvement or total quality management or business excellence. Further references see it closely linked with systemic behavior; yet further ones link it with efforts aimed at peace in the world (Hrast et al., ed., 2006, 2007, 2008, etc.). The current dangerous state of climate change system results to an essential extent from a lack of responsible behavior of humans over centuries of industrialization and all times until today.

²⁴ For details see our publications: »Our Common Enemy (The Climate Change System Threat)« by Ecimovic et al, 2006, and recent books: »The Sustainable (Development) Future of Mankind« by Ecimovic et al, 2007, and



3. The Environment Theory of the Nature

»The Environment Theory of the Nature« has been written for The Nobel Foundation²⁵ as information on the Nature.

The Abstract:

»The Environment Theory of the Nature« is philosophy of the Nature or by other words it is search for knowledge and understanding of the nature and meaning of the universe and life.

The term “environment or surrounding” has many meanings and in my opinion it needs definitions and classifications of different meanings. In regards to my research related to the Nature it matters more for understanding the philosophy of the Nature, as any other known meaning.

The Keywords:

Environment, Evolvment, History, Information, Invention and Innovation, Nature, Philosophy, System thinking.

The Introduction

Present status at the Biosphere of the planet Earth, living conditions and daily events or living of Homo Sapiens present civilization and the rest of the living creatures are showing signs of adaptation to the changing living conditions resulting from changes in the planet Earth's Biosphere environment.

After 1960's the visible changes have become more as just cyclic events within the Solar system and the planet Earth system. Most acute issues have been changes within the weather patterns and most significant change was commencement of the ozone layer destruction because of the chlorofluorocarbons CFC's introduction to the atmosphere by our civilization.

With coming of the third millennium climate change become important for politicians and the scientific world was separated into two fractions:

- The first fraction is advocating humans' responsibility; it has been gathering around the International Panel on Climate Change – IPCC and has been supported by United Nations – UN, “developed” and other national governments, politicians, administration, media etc and they are presenting “official” version of the climate change issues, and

»Sustainable Future, Requisite Holism, and Social Responsibility« by Božičnik, Ećimović and Mulej, 2008; all are displayed at: www.institut-climatechange.si

²⁵ Postal Address: The Nobel Foundation, P. O. Box 5232, SE – 102 45 Stockholm, Sweden, Street address: Sturegatan 14, Stockholm.



- The second fraction is much smaller by number but including fine scientist and good thinking abilities; it is advocating cyclic reasons for the climate changes as events within the Solar system.

During the end of the XXth century and until now I have been researching independently but in co-operation with large number of scientist, and with use of system theory, thinking, analysis and synthesis.

After 20 years of research works I have published “System Thinking and Climate Change System (Against a big “Tragedy of the Commons” of all of us), with R. Mayur and M. Mulej, and coauthors, 2002, ISBN 961-236-380-3, a book 302 pages, soft cover paper edition and CD. It was our first publication in the book form after many presentations worldwide on systemic background of the climate change and introduction of the **climate change system**.

The next in line was “The Information Theory of the Nature” published in 2006, and final part is “The Environment Theory of the Nature”. As usually in our life the things are having a turned-around following order and the last should be the first.

The Discussion:

Discussing that the philosophy is the search for knowledge and understanding of the Nature, and meaning of the universe and life, I would rather say »The Environment Theory of the Nature« is commencement of systemic approach to the meaning of the environment, “**basic environment**”²⁶, Universe and Cosmos as precondition for existence of the Nature.

Let me present the case studies of two recent theories »The Theory of the Environment« and »The Information Theory of the Nature«, which are the most recent research results of my thinking and researching.

Mankind’s²⁷ local communities include variety of many different contents of the human life styles, etc. A major part of it has connections with origin of the people living within the local community, and with the natural characteristics of their environment, within which the local community lies. Geography, biology, physics, chemistry, and history cover in general the main deciding contents.

Common thinking and understanding are day-by-day life issues, local events and communal life stories. All of us are living in a local community, but very seldom we understand individuality of the local community. Countless local communities of the humans on the planet Earth are countless individual approaches of the humans to make living. Beside the family the local community is the basic unit of the present human civilization.

It is very difficult not to see similarity with star systems, planets, galaxies and other energy/matter forms within the known Universe.

²⁶ “**The basic environment**” is novelty in understanding of the Universe as environmental precondition for having anything – The Nature and evolvments within it.

²⁷ From the book »The Sustainable Future of Mankind III« first draft, Ecimovic at all please see at: www.institute-climatechange.si.



As we seldom have opportunities to see individuality of the local community of humankind on the planet Earth, so it is even more difficult or impossible to understand individuality of other planets and the planet Earth. To the countless number of the planets within the Milky Way Galaxy we have to add even more countless number of the planets within the rest of the Universe.

To make it more complex, I have to say, that what we understand of the Universe is a very small part of it, and even less we know how small part of it is our Universe in reality.

The Nature²⁸, the origin of the Earth, the origin of humans, etc, are parts of large content we call »The Nature«. It is hard to answer to all questions of the Nature. But some of them need to be answered for sake of philosophy and understanding of the life and other issues connected with it.

The present science has to undergo future evolvement to be able to answer the basic questions about the Nature. That is why I am putting my recent research in this presentation in order to put on records new theories and possibilities for tomorrow. And of course, tomorrow I expect better environment for humankind and sustainable future²⁹ for our descendants.

»The Information Theory of the Nature« was published in 2006. Here I will present my recent research and new theory »The Environment Theory of the Nature«, which is opening new horizons for research of all issues of the Nature. It is an environment-centric theory, which offers understanding of the present in general and allows for new dimension of research of the Nature.

The environment theory of the Nature is taking environment as precondition for anything.

»Basic environment« of the Nature is the Universe or the Cosmos. Within it the Nature exist in countless forms, dimensions and contents as **»interdependence, interaction and co-operation«** of all matters, energy, information, dimensions, light, rays, powers, forces, particles and yet unknown contents of the Nature.

The beginning or end of the basic environment does not exist, but it is **»continuum«** of the Nature, which makes/holds/transforms all contents. The basic environment (the Universe or the Cosmos) should get proper description, which according to system thinking does not commence with beginning and end, but it exists as **»continuum«**.

The present thinking ability of humans could not accept reality of the immensity of the basic environment - the Universe or the Cosmos. For present researching techniques the basic environment is immeasurable. At present we have researching possibilities for exploring our neighborhood within the basic environment - the Universe or the Cosmos.

Our horizon is limited with our techniques and researching abilities/possibilities. For our understanding of the dimensions within the Universe, we are also limited by our scientific language – mathematics, which is not yet evolved for the needs of the Universe researching.

²⁸ From the book »The Sustainable Future of Mankind III« first draft, September 2009, and partly from the books »The Sustainable (Development) Future of Mankind«, Ecimovic et al, 2007, and digital book »Sustainable Future, Requisite Holism, and Social Responsibility (Against the current abuse of free market society) edited by Bozicnik, S., Ecimovic, T., and Mulej, M., 2008, both displayed at: www.institut-climatechange.si

²⁹ The sustainable future of humankind is harmony of our civilization with the nature of the planet Earth, please see at foot note 2..



That is why humans have discovered the Big-bang theory, black holes, unified theory, strings and many more brilliant thoughts and applications of the researchers, but could not properly describe the basic environment or the Universe.

Putting the “continuum” at centre of the Nature is making a huge difference in possibilities for research.

So we have now the basic environment and the continuum, we have basic relationships such as **interdependence, interaction, and co-operation** of all matter, energy, information, light, rays, powers, forces, particles, dimensions and yet unknown contents of the Nature, where some of statements need to be described, for instance the information theory of the Nature.

The present understanding of the Nature has been going on as long as the present civilization has been evolving. As mentioned before in 2006 the book “The Information Theory of the Nature, and” by Ecimovic, T., ISBN961-91826-1-8 was published with the Information Theory of the Nature, and before within this presentation “The Environment Theory of the Nature” was discussed.

The novelty of the information theory of the nature is research of the term “information”, which has been researched in connection with the system thinking, and the philosophy. The “information” was understood as a system of the abilities, quantities, qualities, relationships, instructions of each and every matter, energy, light, rays, powers, forces, particles, dimensions and yet unknown contents of the Nature under prerequisite of **interdependence, interaction and co-operation**.

Transformation of the matter and energy with their information, it is event simultaneously according to the environment qualities the information. New transformation has its information in same manner as the genetic code of living creatures. It is precondition of their continuum, and it is composed at the moment of transformation. In living creatures it is according to prearranged (by the nature) genetic structure, and in the other parts of the Nature the genetic structure is exchanged for abilities, qualities, quantities and other characteristics of the environment, within which the transformation of matter and energy is takes place. By the continuum the systemic process is upgrading all characteristics of the Nature.

It is important to discuss the system – as a complex entity, rather than mental picture in living creatures’ mind - from the operational content. Any system is in stabile mode as long time as all its internal systems are in stabile mode. Whenever external reasons or instability of internal system have been moved/changed/impacted, or etc., the system as complex entity commences to move. It is not possible to predict the direction of the movement of the system.

For instance, after “Big-bang” (Hawking) had happened, being responsible for our part of the Universe, the transformation of matter and energy has resulted with formation of the Milky Way Galaxy, countless star systems and our star Sun system. From commencement of the Big-bang the energy and matter transformation resulted in new transformed contents, and it has been simultaneously enriched with information of its abilities, and so on. I think a major part of the information is composed by characteristics of the environment within which various processes were and are going on. Of course the environment’s characteristics are also changing or transforming accordingly.



Finally, some 4.560.000.000 years ago the star Sun system evolved in the planetary systems including with our planet Earth. Each part of the system has its own information according to which the evolvments are possible. In my research I think this possibility is opening the door for researching further contents of the Nature.

To be able to conclude these case studies I have to present a short discussion about the time.

Here we have to rethink/discuss our human achievement called the TIME. We humans have a long history of use of the time as practiced. At present the time is a very important dimension of our living. Practically it is very difficult to imagine our living without the time practically in use.

When looking from the Nature's viewpoint, we may see it does not use the time. **The Nature is always in the present.** We may discuss it as the Nature is taking as much time as needed for a certain process. And due to its systemic abilities the Nature is evolving in only one direction – “the multidimensional evolvment ahead”. Direction of the evolvment is not known, but it is result of interdependences, interaction and co-operation in case.

I think the TIME is our civilization imaginative dimension, which is very useful to our living, thinking, discussing, researching, etc, but the Nature does not have the time as its dimension. Processes in the nature are having their evolvment according to the direction of the evolvment and the information, which is assisting it, and it exist only at present.

Due to its systemic quality and human understanding of it by the requisite holism principle of the human approach (Mulej, M., Kajzer, S., 1998), based on the concept of the “dialectical system” as a network of all essential viewpoints by Mulej, M., (1974), the system qualities, and environment within which the requisite holism and wholeness of the nature exist THE PRESENT is viable (to our understanding) or not as a continuum, but it has constant continuum be it to us understandable or not.

The environment definitions:

12. The **basic environment** (the Universe or the Cosmos) it is environment within which the Nature exist as **continuum** of all matter, energy, information, rays, particles, dimensions, powers and forces, and yet unknown contents of the Nature. The basic environment (the Universe or the Cosmos) does not have the beginning or the end, but has countless forms of matter, energy and information transformations, dimensions and systems and it is a system of the Nature.
13. Second to the basic environment (the Universe or the Cosmos) are countless form of matter, energy and information of larger and smaller dimensions of star systems, the galaxy systems, and within them individual star systems, such as our star Sun system.,
14. The basic environment (the Universe or the Cosmos) as system it is making possible the **interdependence, interaction and co-operation** of all matter, energy, information, rays, particles, dimensions, powers and forces and yet unknown contents of the Nature. Consequently each and every case system under observation: big and small bangs, seen or dark energy, black holes, galaxies, star systems and all other forms of systems within it are having their contents and characteristics (individuality).
15. The star system environment it is a particular star system with its internal and external environments and systems.
16. The planetary system is a part of the star system and it has its external and internal environments and systems.



17. The star Sun system is a part of the Milky Way Galaxy, which has 100.000.000.000 + other star/planets systems and countless meteorites and other forms/systems of matter or energy. All of them are moving like a top and circular movement around each other. According to **interdependences, interactions and co-operation** the star Sun system is moving like a top and with app 800 000 km/hour speed circling around the centre of the Milky Way Galaxy. The circular movement is the main physical characteristic of all larger and smaller forms of matter and energy within the Nature.
18. The planet Earth is one of eight planets, but only one of them with environmental characteristics allowing “the living Nature”. The planet Earth contains its three basic environments (the planet Earth basic environments): the Land, the Water, and the Atmosphere environments.
19. “The living Nature” in the planet Earth’s natural system has countless living creature’s larger and smaller forms and systems, amongst which there it is also Homo sapiens’ civilization. All of them share the environment or the Biosphere, which is a tiny and thin part of the planet Earth system’s surface, within the water and atmosphere’s lower part.
20. The Homo sapiens’ civilization has its own environment of different characteristics but in the third millennium the urban environment prevails as its internal environment made by humans. Other forms include: rural areas; agriculture; forestry; transport means systems including roads, railways, airports and ports; industry; sports including sport facilities, etc.; military with barracks, armaments and other facilities; education with schools, universities, researching facilities, etc.; healthcare system with hospitals, researching and other facilities etc.; and etc. In 2008 in Europe (EU) 17 % of total area has been sealed land or land taken from the Nature and occupied by the Homo sapiens’ civilization.
21. The living creatures’ environment could be divided in: internal and external environment. Typical internal environment (within the body) is cell liquid or blood as environment for blood cells etc., while the external one consist of family, local community, society, surrounding, water (bathing, drinking, etc.), air for breathing, etc.
22. Man made system has internal and external environment – for instance the car has its combustion engine as a part of its internal environment, and roads as part of its external environment. Homo sapiens’ civilization’s environment and its natural environment are parts of the general natural environment.

There are many word uses and definitions about environment connected with content of issues like the nature environment or surrounding, etc,

At the end I discuss the environmental sciences, which are quest for knowledge and understanding of environment and there are so many sciences as many environments. Generally I think that “the basic environment” (the Universe, the Cosmos) as the largest possible environment and the only environment with only internal environments could be commencement of the environmental sciences and other could follow. Our civilization should commence The Book of Physics with Environment (“basic environment” the Universe or the Cosmos).

The Recommendations

I am recommending as follows:

- Rethinking of the present use of the term environment and it is necessary to use better or more proper terms.



- Introduction of the system thinking for any use of environment-related word or issues.
- Introduction of the environmental sciences as humans' scientific approach to the Nature and "basic environment" (the Universe or the Cosmos), and other environment systems.
- System thinking should be included as research tool. One should combine systems theories working on a requisitely holistic approach such as Dialectical System Theory by Prof. Dr. (economics) and Dr. (management) Matjaz Mulej with nature-describing systems theories such as the complexity and chaos theories etc. to provide the requisite wholeness of understanding and description and preciseness in its elaboration per parts/viewpoints.

4. The Information Theory of the Nature³⁰

Thinking theory, system thinking, system analysis and synthesis are offering new thinking techniques to assist scientific, common, and whatsoever thinking patterns of our civilization, to restore natural thinking and acting towards a noble and a prestigious target of *sustainable future*³¹ of mankind.

Seeking sustainable (development) future or harmony with the Nature is a path for survival of mankind. Present achievements have to be re-examined with aim of possible evolvments of present society towards sustainable future society. The target is very complex and far from being achieved by present practice of our society, with narrow thinking and acting for benefits of national elites, top sportsmen, artists and show-men.

Our mega cities have reached the peak of non human environment in which humans live on human (good citizens and elite) style and non human style for unlucky ones that live in slums. Our civilization has reached the status where the lands are no more abundant, water is restricted, and the air is more and more polluted.

Our living environment is rapidly changing, and the climate change system is threatening to change it from manageable one to unmanageable one.

Our top international governing body The United Nations have been transformed from human society assistant to assistant of "money" democracies of "big" nations the USA³², G7/25, etc. At present UN in New York is mega millions dollars business for the USA.

Present leadership has put UN in the role of obedient servant of "developed world", multinational corporations and globalization, with no rights for other nations and peoples of under-developed world. The UN Council for Human Rights is missing basic understanding of what is what. UN should establish the Council for The Nature Rights Protection against attacks of human society (what 17 % of sealed land area in Europe is absolute proof of that).

³⁰ From the book: »The Information Theora of the Nature, and«, Ec imovic, Timi, 2006, ISBN 961-91826-1-8

³¹ Sustainable Future is harmony of our civilization with the Nature (Ecimovic numerous statements).

³² Please see complementary book Our Common Enemy – The Climate Change System Threat, Ecimovic at all., 2006 dosplayed at coming chapters or at www.institut-climatechange.si



To provide solutions, one has to re-examine the relevant system. Research is being conducted on a massive scale to understand systems operating within our biosphere. The “climate change system” has been introduced. This leads to studies of the system operating in the environment. Consequently the Information Theory of Nature has been invented. To explain the systemic background of nature three operative but “non-scientific” words are needed – interdependencies, interactions and cooperation³³. It is while talking about impact that we arrive at the “Information Theory of Nature.”

The question then arises as to what is this “The Information Theory of the Nature”? It is a system that is subsumed under a holistic unit of the natural system, including the planet Earth. Nature exists as a system, whether we choose to interact with its mechanism or not. Our civilization has assumed the prerogative to interpret it. There is thus, a dual interpretation to nature. Science understands it as it is, more or less, as a mechanism. Civilization sees nature in a different way. Both these interpretations do influence each other but not in the required holistic manner

If this thinking is applied to our environment then the Universe, and the Earth are holistic units and the biosphere is the living environment/sphere of the planet Earth. The basic relations amongst the earth-nature factors are interdependences, interactions and co-operations.

The Information theory of the Nature has been devised as the basic quality of nature as a matter, energy and information where the information is an integral part of the nature as is matter and energy. Evolution of matter and energy is interconnected with evolution of information. All this should be within an *environment* and under the practice of interdependence, interaction and cooperation.

The information theory of nature is a case study of system theory/thinking implementation, as contribution towards a better understanding of the nature by a civilization. Information should not be misconstrued. It does not mean the process of communication or transmission of messages or a collection of data, its storage/retrieval or any other use of the word. “Information” as used in the Information Theory of the Nature deals with:

- Information as an integral part of basic environment;
- Information as an integral part of matter and energy;
- Information is not only as a part of the existing energy and matter but also of the evolving ones;
- Information, matter and energy do not exist if they are not integral part of the system/environment/basic environment/universe/cosmos in any dimension;
- Information, energy and matter are evolving within the interdependences/interaction and co-operation practices of all levels of systems within basic environment, and are making evolution of the Nature in case (requisitely holistic unit);
- Information as a part of »Information Theory of the Nature« is the ability/quality of environment, matter, energy, information, dimensions, particles, rays or any form of matter,

³³ Interdependences, interaction and cooperation as part of the Nature have been introduced by Ecimovic/Mayur/Mulej at The System Thinking and The Climate Change System, 2002, displayed at www.institut-climatechange.si



energy or natural powers and forces, and yet non known contents within the Universe, to make impact. This theory is a theoretical approach addressing basic problems in understanding the Nature. It fills in the need for a holistic presentation of the nature.

The Information Theory of the Nature can explain any whole, part, unit, mezzo, micro or macro dimensions in an infinite cosmos. One can understand evolved environment, evolution within environment, energy, matter, dimensions, rays, particles, natural powers, forces and not yet known contents of the Nature regulated by interdependencies, interaction and co-operation practices. The rules do not exist but are the result of a particular case content. We may mention environmental characteristics of the case deciding on the rules – like liquid methane rivers and lakes on the planet Saturn moon – Titan. Using this theory one can understand any processes like transformation of matter energy and information within environment under interdependencies, interaction and co-operation principles up to the present. The solution for a sustainable (development) future lies in maintaining harmony between nature/biosphere of the planet Earth and all users of it. This is the answer to the future of our civilization. Systems theory, especially dialectical system theory (Mulej) as a science of interdependence methodology through interdisciplinary co-operation is the core of the future.

The Information Theory of the Nature is commencing point of Environmental Sciences to become a chapter at the beginning of the Book of Physics. It is seen and known when heard and understood, but not yet used at scientific and research work as well as practice or applied research due to need for evolvement of new part of the Mathematics as scientific language of our civilization. The characteristics of the environment are making evolvement within the nature possible.

Let me give two case stories. When Plasmodium the causing agent of malaria enters human blood by mosquito, it is introduced into best possible environment. It reproduces and causes malaria. If not cured it may cause death of plasmodium and host the human.

Big bang theory provides answers to almost 99 % of the theoretical approach to the beginning of Universe. Figuratively expressed the environment is changing our Universe into many other requisitely holistic Universes or one Universe of which our Universe is just a part.

Many more explanations could be elaborated from, the simple systems as combustion engine, human society, rocket etc to finally largest to us known system The Universe, which could be explained by using system theory, system thinking, analysis and synthesis. The planet Earth as a part of Universe, Milky Way Galaxy, and Solar System is representing requisitely holistic unit to hold living nature as it is in our case and the Universe we are a part of. Understanding reality of it is a treasure of Nature given to humanity as path for survival and existence.

The Information Theory of the Nature is a missing part needed for the new frontiers of science movement towards sustainable future of mankind. By evolvement of other contents human society may have option of sustainable future and large explorations within the Nature. It incorporates present knowledge and opens an option for confirmation and reintegration of it. All big achievements as: Big Bang Theory, Unified Field Theory, Strings Theory, Particles research, dimensions research, use of geometry and algebraic operations, reconfirmations of present knowledge, and many more possibilities will be achievements in the future of mankind.



5. The Climate Change System - Introduction³⁴

Worldwide researchers and scientists in complex problem solving, case study research, education, and many other activities of Homo sapiens as individuals and society today must take into account the climate change system affairs, which have a critical role for changes within the biosphere, and include most risky issues at the beginning of the 21st century.

The Climate Change System provides, makes, holds and guards living conditions within the biosphere of the Earth; it has a more important role as humans were thinking in the past. To these conditions all living creatures must adjust to survive. A number of the extinctions of species, smaller and larger alike have resulted from changed environmental qualities, caused by changes in the climate change system.

Systemic behavior enables us, better than single specialists alone, to see that the Earth's biosphere is made as a synergy resulting from *interdependences, interactions and co-operation* of matter, energy, and information within the time frame, and has three bases – Water, Land and Air environments. To be ready for changes, and mitigations due to the climate change system impacts, all of us single representatives of human race must learn more about the basics of the biosphere.

Assessment of risk of the (side-effects of) research has not been well developed during the industrial revolution and recent times; issues like: intensive agriculture; synthetic chemical production; money democracies; (poor) corporate social responsibility, nuclear technologies, combustion engines, have put substances into the Nature environments - sea ocean waters, lands and air – harming them for an irresponsibly long time. Today there is no question, whether or not, but when and how harmful, the impact of the Earth biosphere will be for the living creatures. Scientist and other people/s must understand the interdependences, interactions and co-operation within the environment, and of all matter, energy, and information, to work for sustainable future of our civilization. They should use systems thinking by the Dialectical Systems Theory (Mulej, 1974, see Mulej et al, 2008) to do this job requisitely holistically and therefore successfully.

For millennia, but especially over the centuries of industrialization and even more so recently, individuals/society have practiced the use of nature, environment and biosphere as commodities free of charge. But, today this is more complex: the nature quality is worse due to the impact of the climate change system and human global population. Major impacts of the climate change system on society, such as sudden floods, strong winds, earthquakes, tsunamis and changes within the local environment, may produce bad results. My recommendation is to:

- Apply systems thinking, e.g. the Dialectical Systems Theory linking human work and its creativity with holism of behavior, especially thinking, decision making, action, and with innovation;
- Clarify humans' relationship with their Nature, which will create better relationship of Nature to humankind.

I think it is advisable to learn to know limits and possibilities of the impact on and by the climate change system, to make clear vision of changes, which may affect human society, biosphere and

³⁴ From the book »The Climate Change System Introduction«, Ecimovic, Timi, and Mulej, Matjaz, October 2008.



the Earth. We will now briefly present some basic features of the climate change system in order to support the two suggestions.

The water/land/air systems or biosphere make the bases of life on the planet Earth. Not many researchers and public at large are familiar with interdependences, interactions and co-operation needed for survival of living creatures. The latest research on system thinking and the climate change system has important impact on knowledge of the Nature for humans to better understand their environmental impacts.

From the Nature's viewpoint the climate change system alias the climate, the climate change – is a system as a complex entity of conditions within the living space of the biosphere. Actually the living space is the biosphere itself, which is a tiny part of the Earth planetary system.

Watching the climate, and taking it into consideration when humans have been making their decisions – these have been two very separated issues, especially in the recent centuries in which the industrial life has been taking the lead and has caused a narrow professional specialization to reign and prevail. One-sided insights were misleading and still are so due to oversight of synergies.

There are two main sources of the climate change: the natural ones and the ones caused by humans.

We humans should understand both of them in order to accept the natural ones and to possibly prevent their tough impact on our-selves, such as floods, droughts, air and water pollution etc. But we should better understand and cope with our own tough impacts and prevent them, too.

The natural systems (as complex entities rather than mental pictures of them) could be formally set according to their size as follows:

- MACRO / MEGA / SUPERIOR / SENIOR / VERY BIG etc., systems such as the Universe, the biggest system known to humans, the Milky Way, the Solar System, the planet Earth system etc., and
- MICRO / INFERIOR / JUNIOR / SUB etc. systems that are smaller and are either natural such as Homo sapiens / plant / animal / living creature/s, and or artificial / human-made systems such as a township / car / aircraft / rocket / satellite, etc.

Of course, the above artificial and natural systems cause a need for differentiation of sciences to natural, technical, and social sciences, of which none includes all human activities as an integral part of the nature. We think there are no artificial and natural systems, but all of them are natural as long as they are results of living creatures' activity. Let us use the terms artificial and natural systems for the time-being.

The system theory, system thinking, analysis, and synthesis are the best assistants available today for humans to understand complex problems, which both the macro and micro systems are.

There is no simple system, and there is no system of which we may say that humans know everything about it. This could be stated more rightfully when one uses system thinking, which could make the difference between the scientific thinking of today and of tomorrow.



The challenges to us humans of today are much more complex than ever before, because we have reached a sort of a critical peak of our ability to understand the present time. The proof for this is our relationship with nature, space and environment, which is going to become unfriendly to humans, rather than a good friend, as it was and should be.

Our civilization's anthropocentric philosophy, its present social order, its religious approaches/governances, profit-based democracies, local, national, international and United Nations' bureaucracies, totalitarian rulers, lack of respect between different people/s on the Earth, policies of divide and rule, bread and games (from antique times until today), ruling by information monopoly – are organizational techniques, which need innovation-of-habits/restructuring/transition/new approach for a better, or even any, tomorrow. Whether our civilization will have a better tomorrow or not is a question, which we better answer before its breakdown will happen.

I think optimistically, that tomorrow will enable our civilization to understand nature, space and environment/climate change system, Universe/Cosmos, and other systems. As a result this will open large doors to sustainable future for all of humans and other living creatures on the planet Earth.

The current understanding of the climate change system is limited by anthropocentric and other views; this is less so, when using systems theory, system thinking, analysis and synthesis. They could help us better understand the interdependences, interactions, and co-operation on mono, trans, multi, inter, and supra-disciplinary issues, all of them as an integral part of the inferior and superior systems, within the system of the planet Earth, and further on the Solar system, the Milky Way, and the Universe.

The Nature does not repeat itself, but it always goes in only one direction - multidimensional dynamic evolvement ahead. Its direction is not known.

We humans, with all our beliefs, religions, natural, social and technical achievements, technologies, techniques, governances, local communities, families and relationships, sooner or later think we are Gods, which have to rule the nature, space and environment of the biosphere.

When it comes to the point of joint action, “mutual interest” and survival of our civilization, many excuses are handy such as national interest, national security, national citizens' wellbeing, etc. But all of them are empty phrases defending/protecting individual/collective rulers, and national elites.

I believe into the role of leadership (as a cooperative management and governance), but I believe also into the moderate life style, which allows for long life, respect, peace, and stability, because the Nature requires it.

The current understanding of the climate change system is limited by anthropocentric views. It may be explained with rule of international/national bureaucracies, who have sufficient monetary resources to pay scientists to speak and write as they wish.

Redirection of scientific research, applied research, and theoretical work is hardly possible, as long as one-sided businesspersons, (their) politicians and bureaucracies are handling resources: they learned how to rule, but not how to make a holistic rather than narrow-minded progress in sciences and technologies of the planet Earth systems.



How can one explain the tremendous, but biased, development of armaments, chemical synthetic products, 1.000.000.000 + and more combustion engine motor vehicles, and many more combustion engines, used in aircrafts, ships, boats and agricultural machines, marketing and profit-making oriented products, GMO/GMP, transport system, promotion of “globalization” as a tool for making money, while scientists are not paid to do their basic research work, and must neglect the research needed for understanding issues of the biosphere system, which is threatening our civilization with reactions of the climate change system and the whole Biosphere to human actions?

The pending big “tragedy of the commons” of all of us
is overseen, that’s how. It results from human lack of holism behavior.

The climate change system is a macro system of the nature made of interdependences, interactions, co-operations of superior/inferior natural systems. The climate change system is responding not only to our civilization’s activities, but also to rules/practices – interdependences, interactions and co-operations – of other systems in nature.

If we do not understand the climate change system, it is so due to the improperly directed research. This has nothing to do with the common humans, but with the one-sidedness of the present social order, profit-based democracies, especially in nations of the G 7/25 countries leading our civilization, and international as well as national bureaucracies. They lack the requisite holism and make room for one-sidedness of human actions.

Let’s us take the case of CFCs, the ozone depleting synthetic chemical products, which were produced because of the market-oriented research and production aimed at profit rather than human benefit, and caused the climate change system to react with its change, which may respond with a total destruction of our civilization: **we humans must learn** how to manage ourselves.

It is true that humans did not know of the side-effects of CFC’s, but now we do: there is no reason to continue with the previous practice of using materials about which we do not know how they interact in medium and long term. They include the genetically modified organisms' techniques, war technologies, uncontrolled development and use of new synthetic chemical products, and combustion engines; these are currently the most dangerous activities of our civilization, not to mention information techniques and energy transmissions influencing magnetic fields and basics of the Earth equilibrium. And last, but not least, let us mention nuclear technologies, which would better have remained behind locked laboratory doors, instead of going into use, and resulting in millions of years of pollution.

From energy and gases to planetary explorations, that’s how the origin of the Earth from birth until present times can be summarized³⁵.

The climate or the climate change system has been one of the biosphere systems, which is responsible for the maintenance of living conditions. As a natural system it is inferior to the Biosphere, the planet Earth, the Sun and the Solar system, the Milky Way system, and the Universe. Later on we shall look into separate systems. The climate change system has many inferior systems like: atmosphere, water - seas/oceans, terrestrial, and other areas related to

³⁵ From view point of our civilization (Ecimovic 2002).



biosphere, and all the mentioned systems have inferior systems, which all together make a whole biosphere system.

All mentioned should be understood as dynamic, interdependent, interacting, co-operating, i.e. dialectical systems, which always evolve. The moving direction is **only dynamic multidimensional evolvement ahead**. To an uninterested walking person the nature may look like chaos, but as the late Prof. Dr. Helmut Metzner wrote in “Chaos to Bios”, the nature may look like chaos to us humans, but also our achievements may look to nature like chaos, and not like order, as we believe. It is a requisitely holistic knowledge and ethics, which has to decide on right or wrong.

The climate change system is a very complex system, which is interrelated with a number of superior and inferior systems, and the main purpose of the climate change system is to maintain living conditions within the Biosphere, the energy equilibrium, mean temperature, moisture/water circle system, composition of troposphere, atmosphere and ocean's currents. Many more subsystems exist.

Definitely the climate change system cannot be explained/understood/researched with the knowledge of one or two of the presently known scientific disciplines, but the scientific research approach should be requisitely holistic, supra, inter, multidisciplinary, and done by a team of scientists working for a common goal on a supra/trans/interdisciplinary basis.

It is obvious that scientists need techniques of the system theory, system thinking, analysis and synthesis, complex problem solving, and case research studies to work successfully on the explorations of the nature.

The supradisciplinarity in terms of our research, from the natural sciences point of view, is a precondition for the individual to be able to understand the complex problems of the complex systems.

The supradisciplinary work/research is above the classical scientific discipline's, at least from the viewpoint of understanding the needs of research/work/action aimed at system functioning in regular conditions and otherwise, interrelated with the system itself, and its inferior and superior systems.

The main purpose of the climate change system is the maintenance of the living conditions within the biosphere, and is calling for explanation of life. From our research in natural sciences and other findings we think that the life could be explained by the hypothesis in the following equation:

$$\text{Energy (E) x Matter (M) x Information (I) + Time (T) = Life (L)}$$

$$E \times M \times I + T = L$$

The life should be understood here as life appearance on the planet Earth, which has a unique composition/place/physics/geography/biology and is permanently evolving its own nature, space, and environment quality, reflecting the present status of the system and its superior and inferior systems' qualities.



An integral part of the evolvement in the biosphere is information, which is interdependent, interacting and co-operating with energy and matter in defining the essence of a specific living creature and feature³⁶. Basic information connected with life itself is in their gene structures, which are composed by four amino acids in different combinations to systems, specific of every species for which it has been simultaneously (by evolution) composed.

The first life information has evolved simultaneously by evolvement of the first life structure, and the later evolvements have been a reflection of the evolution. All this is evolving within environment, and by interdependences, interaction and co-operation of all matter, energy, information, dimensions, particles, rays, powers, forces and yet unknown contents of the Nature.

The living conditions are not a set, but rather a system/entity of the biosphere's environment qualities, and are preconditions for life to appear and to be. The theory of evolution, the Gaia theory, the system theory, the known past and present, and status of the biosphere are proving the above hypothesis to be correct.

The origin of the climate system and the climate change system are dynamics of the planet Earth – its appearance and existence, as a part of the Solar system's appearance and existence, and as a result of the Universe's dynamics.

The climate change system rules over the life status on the planet Earth, not by command, but by interrelations, interdependences, interactions, co-operation, impacts and consequences of the system dynamics.

Here we may comment on the role of humankind/present civilization in the climate change system, which may be described as triggering the system dynamics by our activities.

One of triggering effects was when humans discovered and introduced CFC's and other synthetic chemical substances, which under certain circumstances move in higher layers of atmosphere, and distort by action of chlorine ion the ozone – trivalent oxygen molecules – into oxygen. Destruction of ozone as the protecting layer was result of humankind introduction of commercially important synthetic chemical products based on CFC's.

6. Brief history of the planet Earth as one of subsystems of the Universe

The planet Earth appeared around 4.5 billion years ago (4.500.000.000). At that time the planet was something like a ball of energy and gases with temperature around 7.000 degrees Celsius. Within millions of years the planet was cooling down, and the firm matter was formed within two hundred million years. The oldest rocks on the Earth have been dated at 4.3 billions years ago (4.300.000.000).

The planet Earth is an inferior system to the Solar System, the Milky Way, and the Universe.

The Universe is the macro, largest, most complex of all the systems humankind may research and explore, and it consists of all matter, information, light and other forms of radiation, energy, dimensions, particles, rays, powers, forces and yet unknown contents. It consists of everything

³⁶ Please see »The Information Theory of Nature, and« Ećimović, 2006 (www.institut-climatechange.si)



that exists anywhere in space and time (conditionally time included). The universe includes the Earth, everything on the Earth and within it, and everything in the Solar system.

Our Solar system contains nine (eight by new classification) major planets (one planet missing) and along with the tenth and eleventh as new-comers to the family (now asteroids together with Pluto, which was planet before), and thousands of comets and minor planets called asteroids. It also contains the Sun, the star around which the planets revolve.

If we estimate the total existing information in the Universe as 100 units as of now, our civilization's knowledge may be between one and two units.

We have to explore and research much more as we have until now. Of course, we should not forget the system dynamics and evolvments, which both reach beyond our present knowledge of the Universe. Understanding the holistic nature of the Universe, we have to understand that the Universe's dynamics take countless forms, transitions, expansions, big and small bangs, appearances and disappearances, multidimensional levels, large and small dimensions, and all countless features/evolvments.

Second to the Universe is the Milky Way galactic system, which is a limited part of the Universe within which we humans exist.

It is our first exploration target and a system about which we have to learn as much as possible. The Milky Way consist of about 100.000 billion and more stars as systems of whatever form, and a countless number of planets, micro planets or asteroids, and all other forms of energy, light, matter, informations, dimensions, particles, rays, powers, forces and yet unknown contents of any kind.

The composition of the Earth, as a planet inside our Solar System, is "unique" because of the information, matter and energy at its birth.

All forms existing at the moment of appearance are included within our Earth System, and so are many more other forms of the Universe such as light, particles, rays and matter that over the time from the appearance until now have collided with the Earth.

Major influences on the Earth dynamics come from the permanent energy flux from the Sun, and from collisions with asteroids, which arrive from the outer space.

It is important to have this knowledge, which may help us in researching and exploring the climate change system, because the first outside effect on the climate change system is coming from the outer space as asteroids and other dangerous collisions, which have been changing and may change the equilibrium of Earth planetary system as well as the climate change system.

From the past we may learn about a number of occasions on which the Earth climate change system has been reacting with dramatic changes of the living conditions.

They were recorded as Glacial or Ice periods³⁷, which resulted from cooling of mean land and ocean temperatures. Of course, we should not forget that land mass and salt water mass react to the change of mean temperature according to their different abilities. Land mass reacts faster,

³⁷ Please see the »Atlas« at www.institut-climatechange.si



than the salt water mass. Consequently, the life on the terrestrial part of the Earth (totaling app. 30 % of Earth surface) has been affected more than the marine life, during ice periods.

7. Interdependences, Interactions and Co-operations of the Life, Climate Change System, and Biosphere

Interdependences, interactions and co-operations of the life, climate change system, and biosphere are dynamic factors for the evolution of the life forms, and the resulting environmental conditions. The primordial Earth, some 4.5 billions years ago, was lifeless and unrecognizable by our civilization standards. The air was oxygen-free and many subsystems of the climate change system known today did not exist. The climate change system itself was evolving according to the components and relations of the system as it does even today.

The rise of the life on the Earth reacted to conditions of the primordial surface, and its physical and other contents. It took Earth something like 0.7 billion years to evolve the life. The first evidence of the life is dated 3.8 billions years ago. From microbial life of primordial time to final evolving of the complex biosphere around 1.2 billion years ago there was the time period within which the biosphere evolved.

The first biosphere energy transition from the anaerobic to the aerobic energy production by microbial life was responsible for the change of the atmosphere from the oxygen-free to the oxygen-rich one. The oxygen-content was around 40 % and with time it has been diminishing to 21 % as it was at the end of the 19th century.

The oxygen-content in the air was the major improvement of life conditions, which made the difference from the primordial time to the time of biosphere, from 1.2 billions years ago till the present time.

The concentration of the oxygen in the air for living creatures to breathe should not fall below 8 % that is somehow a minimum needed for survival. At present in some heavily populated areas of big cities, the concentration of the oxygen could fall to as much as just above 10 %; I am recommending monitoring of oxygen concentration as a precondition for survival of humans in the fragile and heavy polluted environments (big cities).

Our civilization's first settlements were built some 14.000 years ago, as a result of social life evolution of pre-antiquity humans.

First settlements on European area were built on swampy areas, for security reason, and population was up to 10.000 people. It was a result of the changed conditions within the biosphere that evolved after the last ice period, which was ending some 60.000 – 16.000 years ago. Since then the climate change system conditions on the Earth were almost at the quality of the present time. Of course, changes have existed but not as extreme ones, as the ones coming up now.

The difference between today and 200 years ago is due to the extreme input of our civilization's output into biosphere such as: all sort of waste, and side-effects of nuclear etc. technologies, synthetic chemicals, human population explosion and its consequences; destruction of biosphere



resulted from covering the current needs of humans. In short, and we shall work out the above-mentioned later on, those are reasons/impacts, which cause the triggering effects of our civilization on the climate change system, as consequences.

The climate change system is a natural complex entity/system. It consists of several subsystems and is a subsystem, too, of systems such as the Earth, the Solar system, the Milky Way and the Universe. It is very old and has been changing all the time, offering rather stable conditions to the life forms. In the current climate change system much more extreme changes have been taking place, over the centuries of industrialization and post-industrialization than ever before since the end of last ice age. We humans are not the only cause of this dangerous processes, but though an essential one, especially if our decisions and actions are based on a lack of systemic/holistic thinking/behavior.

The climate change system as an integral part of the Earth biosphere is somehow between its inferior and superior systems; all of them together with the climate change system itself have a number of mutual interdependences, interactions, and co-operations.

As I have mentioned before, the Universe contains all matter and energy, particles, rays, information, dimensions, powers, forces and yet unknown contents. The Universe may have a dramatic influence on the Earth's climate change system, in the case of catastrophic changes affecting the Solar system, and in the case of the Earth's collisions with space body/bodies influencing the Earth's existence.

It happened and may/can happen again. There is e.g. the hypothesis that a collision of the Earth with a cosmic meteorite some 65 millions years ago caused Dinosaurs to get extinct.

The largest and most superior system of the Nature is the Universe. The probability of a destructive interaction of the Earth with the Universe system is very small. Because there is a countless number of star systems and other forms within the Universe, the Earth has a little chance to experience major destruction caused by the Universe system activities. The Earth system is namely just a very small part of it.

The Solar system is a very large system, from our civilization's point of view, but a very small one from the galactic point of view, and even much smaller from the Universe point of view. The Sun and its eight planets make one small sub-system of the Milky Way Galaxy. Actually the Milky Way Galaxy has hundreds thousands of star systems, and our Solar system is just one of them.

The Sun is the central star of the Solar System, and has 99.8 percent of the Solar system mass. It is the center of its system, and source of all energy and matter within it. Of course, it is an inferior system to the Milky Way Galaxy, which is over 100.000 billion times bigger in mass as the Solar system.

The Solar system revolves around the center of the Milky Way Galaxy at a speed of around 250 kilometers per second.

For our Earth planetary system the Sun is the source of everything from birth of the planet onward, and we exist because the Sun is providing us energy, warmth, light, and all other important inputs – physical and other components and interdependent, interacting and co-operating matters. Our planet system is completely dependent on the Sun. Our present time



and experience is mirroring physical, geographical and biological etc. statuses at which we are at this very moment.

Of course, the influence from the Solar system is not caused only by the Sun, but also by a number of interdependent, interacting and co-operating relations with neighboring planets, planet-like bodies of different size, Moon and other forms of energy, matter, and natural powers. The planet Venus is the closest to Sun, and the outer planet is Mars. Together with Mercury they are presenting terrestrial planets of the Solar System.

The other four planets Jupiter, Saturn, Uranus, and Neptune are gaseous gigantic planets on the outer part of our Solar system. The last planet (not more planet but asteroid) is Pluto, but it is not always the last one, because of its oval-shaped orbit, which places it sometimes before Neptune, but most of time it is the most distant one from the Sun. Recently 2 new celestial bodies have been discovered in line from the Sun and after Neptune/Pluto.

The Solar system is stable, and changes in its system qualities are reflecting/influencing its entire system. The most important parts of the Solar system are the energy flow from the Sun to the planets, and the quality of each planetary system. Not only each planet's composition, but also its distance from the Sun is a deciding factor for the quality of the Solar system. The life stream of light and warmth from the Sun enables life on Earth.

Both the quality of the Sun system and unique Earth's composition/distance from Sun make interdependent, interacting, and co-operating parts of the life-support system on the Earth.

Understanding of many powers and forces of nature is important. They include gravitational, magnetic, energy, matter and information transformations, rays and particles etc., dynamics/movements (like the top, orbital, galactic, and of the Universe), the Solar system, the Sun and planets including our planet the Earth. Synergistically, they make characteristics, interdependences, interactions and co-operations of the whole system.

The Sun has a diameter that is 109 times bigger than the one of the Earth, and 400 times larger than the one of our Moon. All eight planets and all other formations within the Solar system are orbiting around the Sun. The Sun and all planets move like a top and all together orbit within the Milky Way Galaxy. All this movement should be more researched to allow us to understand the basic powers resulting in interdependences, interactions, and co-operation among parts of the Solar system. The Solar system as well as all other systems is functioning according to their given systems³⁸/entities of parameters. Our civilization has its chance to explore research and understand the Nature and our existence.

The birth of the planet Earth could be placed around 4.5 billions years ago. At that time the Sun provided the energy and matter for shaping its subsystems, planetary systems and other bodies. The Earth appeared as a gaseous mass which, by rotation like a top and orbiting around the Sun for a few hundred millions years, commenced shaping the planet. The composition at its birth, its distance from the Sun, and its interdependences, interactions and co-operations within the Solar system have been creating the Earth for 4.5 billions years.

³⁸ We say »system« rather than »set«, because in the systems theory a system consists of two sets, mathematically: the set of its elements, and the set of relations between them (and with its environment) resulting in synergetic attributes that the entire system has, but its elements alone do not. Hence, speaking of a set would mean the traditional oversight of relations and their crucial importance.



8. The Earth Planetary System

The Earth planetary system is very robust. At present we are having an inner core of 1.500 miles in diameter composed of iron and heavy metals, an outer core of 1.400 miles, a lower mantle of 1.400 miles, upper mantle of 400 miles and the crust of 2 – 45 miles in diameter.

On the top of the crust, there are permanent dynamic changes caused by the natural powers by which the Earth's surface has been and is shaped. The atmosphere covers, protects and completes the biosphere of the planet up to 650 miles or 1.000 kilometers, where the Exosphere is ending into the outer space. The main subsystems of the Earth are: its planetary body, its Moon, and its atmosphere. Its planetary body has 8.000 miles or 13.000 kilometers in diameter. The Earth is the fifth planet by diameter, the largest one is Jupiter with an eleven times longer diameter, and the smallest one is Pluto³⁹ with around one fifth of the Earth's diameter.

The surface of the Earth together with its atmosphere makes its biosphere, where we live and where the life has been a part of its system for more than 3.8 billion years. At that time in history the first appearance of the microbial life could be placed.

Among the life supporting components of the Earth, oxygen is the most important element. It forms:

- Two inorganic oxides - water and carbon dioxide, which are the life-supporting molecules,
- Atmosphere with oxygen molecules in the air we breathe, and
- The ozone layer as the protection against UV rays.

After establishment of such a support within the biosphere system the appearance of life on Earth was just a matter of time.

The outer supporting part of the Earth is the flow of light and warmth from the Sun. It is enabled by the Earth's adequate distance from the Sun, actually, and supports life on Earth rather than prevents it; on the Earth's neighboring planets Venus and Mars life is prevented.

The unique composition of the planet Earth and its distance from the Sun are two major qualities that have evolved with evolvement of the Solar system, and make the basic possibility for life to appear on the Earth.

The Earth crust surface is at present made of a terrestrial part, which covers around 30 percent of the surface, and of ocean/sea waters cover taking the remaining 70 percent of the surface. The ratio between oceans and lands was changing with dynamic changes of the Earth surface evolvments. The first appearance of the water on the Earth was the deciding factor for the formation of its surface and atmosphere. After cooling down the atmosphere was thick and much lower than now. The primordial atmosphere was oxygen-free. A big change came from the appearance of the first life forms. These were the anaerobic microbial organisms living

³⁹ Data about the new 2 outer celestial bodies are not yet known to me; one missing planet might also have a questionable content within the present status of the Solar system. Pluto has ben re-clasified and is not more recognized as the planet.



without oxygen. They were gaining the necessary hydrogen for their synthesis of different organic carbon compounds from dissolved inorganic compounds of carbon. Change of the primordial Earth from its anaerobic to its aerobic stage took hundreds of millions of years. Bacterial life significant contribution was the sink of carbon dioxide, when their dead cells settled as sediment on the oceans bottom. There they have been transformed into numerous carbon compounds that we see today as fossil fuels. It was the time of the first energy transformation; actually, anaerobic microorganisms transformed sugar molecules to gain two units of energy per molecule.

In the next generation microbes were able to split water molecules by using the light from the Sun, and used the released hydrogen to reduce the carbon dioxide molecules. By this photosynthesis a rich biomass was produced. The end product of this reaction was the molecular oxygen, but its appearance was poisonous for the existing living creatures. It changed the life critically: the new generation of microbes was able to use oxygen in its oxidation of biomass by respiration. It was the first energy transition on the Earth, because with such a transformation of the sugar molecule they gained 36 energy units or eighteen times more than the anaerobic microbes.

The carbon dioxide was a part of water due to its solubility, while oxygen that was not solvable in water, became an integral part of the atmosphere. The concentration of the oxygen in the atmosphere was increasing and changing, and settled at 21 %, with 78 % of nitrogen, and the remaining 1 % was made of carbon dioxide, methane, and some other gaseous elements.

With appearance of oxygen in the atmosphere, with influence from the Sun radiation the oxygen molecule was split down to the elementary oxygen, which in the upper layers of atmosphere made the three-valence oxygen molecule ozone. With time the ozone formed an UV-impermeable screen or ozonic protection-layer against those rays from the Sun, which has been responsible for decomposition of the dioxide molecules – the UV rays. The biosphere on the Earth responded with evolution of life, its intensification and transition from water to the Earth's terrestrial parts.

The bacterial life moved to the terrestrial part of the surface, forming on it crust top a carbon-rich layer, which eventually became what we today call soil. The Earth system evolved to the stage when complex life forms were able to appear. It was some 700 hundred millions years ago. Land mammals appeared some 350 millions years ago. The human predecessors are dated some 8 millions years ago, and Homo sapiens, our predecessor, some 200.000 years ago.

So here we are – we have the Universe, the Milky Way, the Solar system, the planet Earth system, and the life on the surface of its terrestrial and aquatic part as well as within its atmosphere. With the existing input/output effects from superior systems, especially the Solar system, with evolved parts of the Earth system, etc., the climate change system became the provider, maker, holder, and guardian of living conditions within the biosphere.



9. Requisite Holistic/Systemic Thinking/Behavior – Basic Principles Applied to the Climate Change System

System thinking, synthesis, analysis, complex problem solving, case study approach, as well as the traditional science and research and learning, are prerequisites for opening of the Nature's knowledge box. This is a crucial goal for research and success of our civilization. Preconditions for sustainable future are directly related to human ability to support supra, multi, and interdisciplinary research applied toward this purpose.

History and status of the system could be known, the near future also, in case of continuity, but predicting the future could be done only in the case of a stable status of the system. The Earth had over 10.000 years of stability, but no more now, due to destabilization of the climate change system. It has been triggered by impact of our civilization and natural responses to that effect: when the system has been destabilized, it is quite impossible to predict any relevant information on future evolvments, and it is situation with our Biosphere.

The described facts, though, do not mean that there is no impact of us humans over the climate change system. We do have an impact for sure, and its contents depend a lot on our own thinking/behavior. Our one-sidedness is quite natural and equally dangerous at the same time, potentially leading to our own extinction. We should better add something to our behavior, which is called holistic/systemic thinking/behavior. It is briefed in the Table 1 as follows:

Table 1: The Basic Seven Groups of Terms of Systems / Systemic / Holistic versus Non-systemic Thinking⁴⁰

Systems / Systemic / Holistic Thinking	Unsystemic, Traditional Thinking
Interdependence/s, Relation/s, Openness, Interconnectedness	Independence, One-way-Dependence, Closeness
Complexity (plus complicatedness)	Simplicity, or Complicatedness only
Attractor/s	No influential force/s, but isolation
Emergence	No process of making new attributes
Synergy, System, Synthesis	No new attributes resulting from relations between elements
Whole, holism, big picture	Parts and partial attributes only
Networking, Interaction, Interplay	No mutual influences

The climate change system is an integral part of the planet Earth biosphere. It has no clear-cut borders with other systems in the nature, like we humans are used to think and see. The climate change system is rather a part and complex natural system that actively takes/uses/puts/gives inputs/influences/impacts, receives outputs/influences/impacts from all inferior and superior systems, and reflects the present ones – as living conditions at the very moment of observation. Observer can go back in the history of evolvments, but cannot go into the future, due to countless possibilities involved.

⁴⁰ See M. Mulej's The Dialectical Systems Theory, presented also in the book System Thinking and Climate Change System displayed at www.institut-climatechange.si



The difference between the human's traditional thinking and the systemic thinking could be described as follows, when it concerns the climate change system: when observers look at our civilization's achievement from the viewpoint of building and construction heritage, it looks nice, everything is in order, the arcs are arcs, lines are in a geometric order, and the whole construction follows a certain tradition/style/architect's mind work. Of course, there is no absolute rule: e.g. the great architect from Catalonia, Gaudi, has demonstrated his innovative approach to churches and other constructions. Also our houses, exterior and interior arrangements, agricultural activities, communications, roads/railways etc., follow a certain order, which does not look like the virgin nature. To us humans from this civilization the virgin nature looks like chaos, and we are not able to see that Nature sees us as chaos too. It is also difficult to comment whether the discrepancy between nature and the human life style is now big or small, but obviously we humans have done many various interventions and innovations, which are not a natural way of acting. So, for the conventional thinking chaos of nature is chaos, and our life style is all right. On other hand the system theory/thinking may allow us humans to see the natural chaos as order and the human's order as a sort of chaos. When not only scientists, but also common people in the local communities will have this ability, we shall have much more of a natural habitat as we do now.

When we apply the above findings to the climate change system, we may understand "chaos" as interdependences, interactions, and co-operation of many different systems of nature resulting from parts of the very complex climate change system. Of course, we should not forget that this thinking is human thinking with all good and bad attributes.

The climate change system is a composition of a permanent evolution of the natural systems, which support the biosphere as the space for living creatures within nature. We have seen dependences of the climate change system on its superior systems; let us first list the influences, which may occur from them to the biosphere.

- All changes/evolvments of the Sun system have an absolute impact on the biosphere. They have a strong impact on the Earth, and most probably grave consequences, when changes at the Sun system evolve. More scientific research should be directed towards understanding of effects from the Sun on evolvments of our biosphere. As the major provider of warmth and light the Sun has a strong influence on our biosphere.

- The Moon/Earth equilibrium has also a high ranking.

- The meteorites from the Universe, the Milky Way and the Solar system as well as other forms of matter/energy/particles/rays and the forms/powers/systems not yet known to us humans have influenced and will influence our biosphere. Fortunately, their impacts are not so frequent.

- The planet Earth's attributes studied by physics/geography/biology have a very important position. Due to permanent evolvment, interdependences, interactions, and co-operation, etc., the powers of nature have created our biosphere, and keep creating it. We humans can see its past and present. We can understand dynamics of some of the mentioned systems/powers, but not of all of them. Our current knowledge is failing to use system thinking, as a possibility to better understand the system inter/dependencies and dynamics.

- The inner core of the Earth has some 1.500 miles in diameter and is moving like a top with a different speed than other parts of the planet do. Any change in the revolutions and directions



of the movements could have a strong impact on the Earth system. More research is needed, to understand this subsystem, and its interdependences, interactions and co-operations with other subsystems.

- The rest of the Earth – outer core, lower mantle, upper mantle and crust totaling some 3.200 – 3.250 miles in diameter have a number of common interdependences, interactions, and co-operation which influence the biosphere. Earth's permanent changing under its surface is broken into numerous crust plates, which are in constant motion with respect to each other because of the powerful internal forces. Volcanic activities and earthquakes are products of large-scale crust plate collisions or separations. Both activities have complex impact on our biosphere, from the local direct disastrous impacts by lava, ashes and land movements, to the even tougher impacts in cases of strong eruptions and large inputs of ashes into our atmosphere. They result in impacts on the biosphere as a whole.

- The natural powers such as gravitation, magnetic force, electricity, etc., circular movements like a top and joint movement within the space of the Solar system, the Milky Way, and the Universe are extremely important and not yet fully understood by our civilization, as well as the particles movements and system abilities.

- The climate change system – the provider, maker, guardian, and holder of living conditions within our biosphere has been composed of a large number of systems, which are interdependent, interacting, and co-operating to evolve into the present condition at the place of observation, all at same time. Thinking globally, the climate change system could be observed in some of patterns or expressions or variations, which show up in different values of temperature, moisture, and currents.

- The biosphere is composed of terrestrial, aquatic and atmospheric subsystems. Their characteristics are basically the frames, within which the climate change system has its role as the provider, maker, holder and guardian of living conditions.

- Very well known geographical facts of the Earth, such as latitude, longitude, and altitude are qualities decisive for warmth and light, which are reflected in the quality of local environment. On the other hand the distribution of this quality depends on the basic characteristic of land or aquatic environment. Of course, when differences meet, at bordering environments, their quality is more complex. And it is not so simple, when taking into account complex interdependences/interaction/co-operation of all different systems together, which have something to do with the climate change system.

From the selected viewpoint, the most important inferior system of our biosphere is life on the planet Earth. As soon as the primordial Earth was ready to host life, it appeared. In ocean waters the anaerobic bacterial life was the first to influence all latter evolvments. Due to the exceptional reaches of ocean waters full of inorganic compounds the first bacterial cells had an excellent life environment. The ocean waters protected them from UV rays and the temperature of waters was suitable. The light and warmth from the Sun had a lower radiation than today. All phases of the anaerobic life lasted from its commencement on from around 3.8 billions years ago until the appearance of oxygen in the atmosphere around 2 billions years ago.

The bacteria have changed the Earth's biosphere from an oxygen-free to an oxygen-rich one, from an environment unprotected against UV rays, to environment with ozone layer as UV



protection zone. Sterile terrestrial lands changed to lands rich with life. After the change from the anaerobic to the aerobic life the biosphere changed, and many complex life forms evolved.

The water cycle, the oxygen cycles, the carbon dioxide cycles, the sulfur cycle, and waste of organic compounds together with life itself have been an integral part of the biosphere's environment. The basic influence transferred the fragile environments into life-friendly environments, and resulted in protection of the Earth surface against erosion and its consequences such as destruction of lands, ocean water currents, and air movements that have been established as regular or temporary.

The biosphere was evolving and became the space for life and living creature. Physical, geographical, chemical, biological and systemic interdependences/interactions and co-operation enabled an environment supportive of evolvement of life. Today, we may find at the same time within the Earth biosphere primordial conditions as well as any later evolvements, which followed them later on. Our present biosphere has a countless number of biological sub-systems, which are, along with their synergies, ensuring the life continuity in the present and many other possible and changed environments.

The terrestrial lands, from the frozen Arctic/Antarctic environments to the tropic conditions, are home of a large number of different living creatures systems, which all together make a comfortable living as long as they follow the system interdependence/interactions and co-operation.

All ethological differences are a part of the maintenance of environmental matter exchange, in which numberless biosphere sub-systems evolved for the life to continue. The changes/evolvements are consequences of interdependences/interactions and co-operation of all systems involved. The same apply to the evolvement of the aquatic and atmospheric environments. ***The biological system is a moderator of living conditions within the biosphere.***

The Sun provides energy – light and warmth. The planet Earth protection systems are ozone protection zone in the Stratosphere (15 – 24 kilometers) and the green house effect (the natural parts of which are carbon dioxide, methane and nitrogen oxide). Both protection systems are filtering/transporting radian energy to the Earth surface and back to the outer space. In geographical terms, the Earth surface has now around 30 % of terrestrial and 70 % of water areas (oceans/seas). The energy equilibrium results from inputs and outputs of energy. Changes within inputs and outputs interfere with energy balance, and their consequences is either cooling or warming. But due to the complex system characteristics of the Earth such as: changes in the atmosphere, changes at the terrestrial part, changes at the oceans/seas waters, changes within the biology of the surface, and anthropogenic inputs, its reaction to warming or cooling follows different patterns. The air movements and oceans/seas currents have an additional influence adding to this complexity. ***The energy balance is a most important life supporting system, and the changes within it are very destructive for the biology of our biosphere.*** Changes result in extinctions of animals, plants and bacteria, and appearances of new forms of the life. Drastic changes are known as glacier or ice periods; in the past the Earth experienced a number of them.



10. The Water Circle – a Crucial Component of the Climate Change System

The water circle makes the difference between the planet Earth and the other terrestrial planets Mars, Venus, and Mercury. It is a part of the biosphere and has surfaced at the birth of the Earth. The water cycle is a sub-system of the biosphere, which provides the basis of quantity/quality of the biosphere environment. After birth of the Earth, as soon as it had become cool enough, water appeared in liquid, ice, and gas forms; the water cycle commenced its permanent action and evolvments. As an environment it has excellent transport and interaction abilities, which probably, together with other sub-systems: cloud formation and movements, lightening and natural electricity, assisted the birth of life. Life appeared in aquatic environment, and it took almost two billions years for life to move from the aquatic environment into terrestrial lands. 97.5 % of the Earth water is there in oceans/seas, and fresh water makes 2.5 %, of which: 68.7 % is there in glaciers (which are diminishing due to the climate change system impact on the main surface temperature), 30.1 % in underground waters, 0.8 % in permafrost (also decreasing), and 0.4 % in surface and atmosphere waters. Surface and atmospheric waters are: lakes 67.4 %, top soil moisture 12.2 %, atmospheric waters 9.5 %, swamps/marsh lands 8.5 %, rivers and streams 1.6 % and biota waters in living creatures 0.8 %. Yet water is a needed quality of biosphere, as a precondition of life. Most living creatures have between 75 and 95 % and more of water content within their bodies. Water is the main transport system within cells, tissues and all the body. Water is the main environment for chemical processes in nature. Water is the main architect of nature, when carving mountains, lakes, rivers, and shaping the Earth surface.

L I F E A N D W A T E R ,
W A T E R A N D L I F E ,
L I F E ,
W A T E R .

From the book “Slovenia Yesterday, Today and Tomorrow, Water Management Challenge to Slovenians in the Third Millennium”, by Ecimovic, Jan and Vrhovsek, Ljubljana, Slovenia, 1998 (in Slovenian).

The water movements/currents of oceans and seas result from the temperature and salinity difference, winds and interdependences/interactions and co-operation of other Earth systems – gravitation, Earth movement, air movement, energy balance, Moon and Sun gravitation, etc. The present status of oceans currents has an important role within the climate change system. Changes within them may have dramatic consequences for all other parts of Biosphere. Tsunami catastrophic disaster in last days of 2004 has demonstrated the power of Nature.

Air and water are permanently interdependent, interacting and co-operating, when water changes from liquid to water vapor, which is transportable by air. When temperature changes in the processes, assisted by the air particles (physical or biological), the water vapor changes into ice and liquid form and comes down to the surface as precipitation.

Mountains are water towers of the terrestrial surface, and the forest is the primary filter of water and its transporter to the underground. Rivers take water to lower altitudes; with their



biological system they are secondary filters/conditioners of water. The river waters are the main transporter of mineral components from mountains and higher altitudes to lower altitudes and finally to the seas.

When waters from higher altitudes do not find their way to lower altitudes, lakes show up, and with their biological life they form the lake waters systems. Of course, lakes can have river water input and river water output, but the lake water body is placed under the level of water outtake. Lakes are the water storages at higher altitudes.

Swamps, swamp-forests and marshland areas are the best biological filters of water, and they usually are placed at lower altitudes and as estuaries. At all locations where water (fresh or salty) and land meet, there are the biologically richest regions. The planet Earth matter exchange is possible due to water's active transporter role, and the activity of environment with biological richness, which helps our health by purifying the terrestrial surface waters.

The underground waters transport water under the Earth's surface and provide water in water springs. There are large underground waters at deeper levels of terrestrial and ocean/seas bottom levels, which are there because of the Earth crust movements. They are underground lakes of waters rich with minerals and usually sterile.

The terrestrial surface water movement results from both the altitude and gravitation: water has the golden ability to move downward (gravitation), and it has a leveled surface when staying. The terrestrial, biological and atmospheric waters are less than one percent of total waters on the Earth, but due to water circle they are an important sub-system of biosphere.

11. The Atmosphere as another Crucial Part of the Climate Change System

Between the Earth body and outer space there is a large environment of gasses, rays, particles, nature powers and forces called atmosphere reaching up to 1.000 kilometers. The first ten to fifteen kilometers are called the troposphere, the lower part of the atmosphere. It is the weather-impacting subsystem where the air movement is most frequent. It is here that clouds are formed and move; here, one can find living creatures, from birds to microbial life forms. Troposphere is followed by the stratosphere reaching 15 – 50 kilometers from the Earth's surface, including the ozone protection layer (15 – 24 kilometers). Mesosphere (50 – 85 kilometers) and Thermosphere (85 – 400 kilometers) end into exosphere, which ends into outer space at the altitude of around 1.000 kilometers. The atmosphere is a gaseous cover of the Earth surface and it is an integral part of the biosphere and of the whole the planet Earth system. It takes, transports, rebounds, transforms the cover of the Earth for the Sun's rays of light and warmth, as well as for any rays/particles/outer space bodies/nature powers meeting the Earth as a whole.

Two main gases make 99 % of the atmosphere: nitrogen 78 %, and oxygen 21 %. As everything in nature their distribution, movement, and content change within limited possibilities. The remaining one percent is made of the natural presence of carbon dioxide, methane, water vapor, nitrogen oxides, argon etc. The oxygen is present as dioxide, ozone, carbon dioxide, and water vapor. Our civilization has contributed additional contents of gases



into atmosphere such as: additional carbon dioxide, additional methane, nitrous oxide, chlorofluorocarbons CFCs, hydro fluorocarbons HFCs, per fluorinated carbons PFCs as green-house gases. As photo-chemically important gases there are carbon monoxide, oxides of nitrogen, and non-methane volatile organic compounds NMVOCs, which indirectly contribute to the green-house effect.

The atmosphere is the largest part of biosphere. It has an important role of making life possible by oxygen concentration, which is the life-supporting gas amongst the atmosphere gases. Secondly it is the area of water vapor transport, cloud formation, and the main transporter of the water circle, important from the biology point of view.

The air movement in the multidimensional space has regular and irregular patterns, and now during the climate change system movement the extreme air movements are recorded. The wind speed of up to around 500 + kilometers per hour has been recorded in the last 20 years. For the biosphere, the air movement is of great importance as a transporter of life forms, moisture supplier, and local weather maker. On the other hand it is antagonistic to the human constructions, which are usually demolished, if they are constructed at too low standards of the wind/tornado/typhoon strength, when it occurs.

The carbon cycle was probably the most important cycle during the primordial Earth times, because it caused the crust formation and carbon layers deposition at ocean/seas bottom and on land surface. It is a direct in/output of biology, and partly of the biosphere chemistry, processes.

Carbon is a constructing element of the biosphere. A very fast (less than 1 year) exchange of carbon is typical of the plant life. It is today the second carbon exchange, which takes the first place as the very fast carbon exchange. Fast (1 – 10 years) carbon exchange comes from soil and oceans/seas surface. Slow (10 – 100 years) is exchange of carbon within the forest systems. Very slow (more than 100 years) carbon exchange is important in the biosphere as deposition of carbon by microbial life and Calcium carbonate sediments/rocks. Due to the relatively slow processes within the carbon cycle in nature, and the relatively fast input of carbon by our civilization into our biosphere, we face a situation, which the existing processes in the biosphere are not able to compensate. It is one of the reasons for the global warming.

The sulphur cycle has been a less important cycle in the nature during the time when our civilization did not exist. It has its important role within nature, but our civilization causes damages in nature by increased quantities of sulphur (acid rain) that have become fast a damaging factor. The sulphur is an essential element for the life to exist on Earth.

12. Our Civilization as a Hampering Precondition of the Climate Change System

Be our civilization an inferior or a superior system of the biosphere, the planet Earth, Solar system or Universe, it is a small system, but an influential integral part of the whole. Today we are discussing our problems of nature, space and environment protection (protection against whom?), but even the great Greek philosopher Plato stated more than 2.000 years ago:



“When there still were forests growing in the mountains of Attica, the rich soil received water and stored it, so that the absorbed mass slowly became distributed from the heights, feeding fountains. But now the fatty and rich soil has been washed away and just the meager framework of the landscape is still present – comparable to the skeleton of the body attacked by illness”.

The systems have not been properly named “important and unimportant systems”; all of them are systems and interacting/interdependent and co-operating to produce the results present in the Biosphere now. But we humans did not follow the nature’s instructions that we should think of interdependences, interactions, and co-operations enough, so far. The Dialectical System Theory may offer a more promising possibility/tool than the General Systems Theory; I have discussed that in our book “System Thinking and Climate Change System”.

The climate change system as an integral part of the Earth Biosphere’, has a bigger influence on our civilization as we humans of our civilization think and believe. In absolute terms the climate change system is provider, maker, holder, and guardian of the living conditions, which are making our life possible. But we humans are one-sided, although mostly trying to do our best in our modern relations to nature and each other; thus, we do not to appreciate this fact, but harm the climate change system as much as we can, yet it could be even worse.

There is a theory of the anthropocentric interference with the climate change system, trying to explain reasons for the climate change caused by our civilization over the last 200 years, 1800 – 2000, and we would like to discuss it and to assess feasibility of such a theory.

The philosophy about this issue was written many centuries ago when the story of David and Goliath appeared. But by our standards we humans do not view our David-like abilities and impacts as a general practice, and we do not know what we are, what is our natural system, which systems are we interacting/interdependent/interrelating and co-operating with, and where do we belong. What too many humans do understand is how to make money out of our civilization and how to use/misuse/abuse the nature’s richness for it. What are our impacts and what could be their consequences, most of us humans do not care. For our civilization to survive on the Earth, we have to recognize the biosphere’s limited capacities for our, human, species to be successful rather than to harm ourselves. It is not only competition but also, and most of all, interdependences, interactions and co-operation, which enables our civilization’s life. As long as we shall live on the present paradigm, which could be seen as hiding the reality and misusing/abusing the Nature, rather than take the long-term responsibilities for our civilization’s impact on our own biosphere, we shall be increasing the discrepancy between our civilization and our nature/our biosphere – and diminish our benefit from it.

It is *not the planet Earth* that is the home of our civilization, but *the biosphere*, which is a tiny part of the planet Earth. Vulnerability of the two is two, not even comparable, issues.

The present status of our civilization says, that humans do not see our civilization requisitely holistically – as a system, and overlook what are interdependences/interactions and co-operation needed for a sustainable future of our civilization. Though, these are the issues of “to be or not to be” and important for our civilization’s well being.

If we accept that the origin of our ancestor, the Homo sapiens has been dated some 200.000 years ago and her first settlements some 14.000 years ago (the first settlements in Eurasia), and great cultures (China, India, Mesopotamia, Egypt, Persia) 7.000 – 3.000 years ago, we



may discuss *from where* we are. But *what* we are, from the point of view of the natural sciences – biology of the biosphere and planet Earth, this issue is not included into any old script or our predecessors' philosophy. Religions – the permanent supporters of our civilization are our predecessors' innovations, but they have never discussed the origin of the civilization. Their focus has always been on human being and how to take from people as much as possible. Existence, economics, and ideology have always been interdependent. Warriors, kings, rulers, democrats from the past (such as the ancient Greeks some 2.500 years ago) and present, religious / spiritual leaders, politicians and many others, who have been self-appointed, elected or appointed, were products of their time and ruled as they ruled. The tribe stories – on and by people, chiefs, and spiritual leaders – describe what we are, but do not discuss what are we doing for our living, and what is our civilization's impact on the biosphere.

If we accept that we humans are an integral part of the planet Earth biosphere – nature, and the peak of the life tree on the planet Earth, from the natural sciences point of view, and take system theory as our thinking tool, we may say that we belong to the planet Earth biosphere as interdependent part/content/living creature.

Thus, our civilization is *one of the many living systems* inside the planet Earth biosphere and we may say that we are one of the planet Earth civilizations. Which are the other civilizations? From our research we may point to many living creatures and large civilization, which are out-numbering Homo sapiens by the number of their members many times. Among the largest populations are microbial species, etc. It is known that survival is based upon availability of food, water, air, and space, but what has never been considered, is the impact of the species on the food/water/air/space availability. In nature many species are known, which have a short lifetime, as individuals/individual representatives of their species, but as species they have been around for very long time. The classical case are microbial cultures – parasites, which destroy their host and themselves, but not as species, but as a present culture invading the host. This is a life story, one among many others. And the nature has taken care of matter transition within the kingdom of life. It is a permanent system of matter transition from “ashes to ashes”, not used for ruling the humans but presenting the circling of matter within the biology of the biosphere.

Let us see ourselves in this context. First scattered settlements were where the food, water, air, and space were abundant, and settlements flourished. When settlements had joined, the cultures/nations were established. And as long as the food, water, air, and space were abundant the culture was in good shape, but when food, water, air or space became restricted, the culture went down. So finally our civilization has come to ***Age of Globalization*** and became our and global ruler of the planet Earth. After a few millennia, food has still been abundant (in 1960's), and water was abundant (in 1960's), and air is abundant (at the beginning of the third millennium), and space looks like being abundant. But at the end of second millennium the food was no more abundant, the water was no more abundant, the air was no more abundant and only space still looked like abundant, which in fact is neither so any more. Is the end of our civilization approaching us?

From the natural sciences point of view: yes, it is. But, any culture in the biology of the biosphere has its time of birth, childhood, adulthood, old ages, and history, anyway.



13. Human Capacity of Requisite Holism – a Crucial Precondition of Benevolent Climate Change System Process Still to be attained

The novelty to be attained – and to be made innovation – could be the ability of the current Homo sapiens to think, understand, and learn, how to *requisitely holistically* manage our own civilization affairs, e.g. provide to all humans food, water, air, and space for living. This task can be done better, if the systems thinking is used, but rather the Dialectical Systems Theory addressing the human attribute and interdisciplinary cooperation than those systems theories that focus on precise description of a feature from a single viewpoint.

The climate change system is an integral part of the Earth's biosphere and it has a multi-complex purpose to provide, hold, make, and guard basic conditions of the life: temperature, water cycle, air-sea-ocean movements, protection, management and regulation/control of the biology of the biosphere.

The climate change system is one of sub-systems of the biosphere. Which parts of the biosphere system could be affected by impact of our civilization is a question, which we shall try to indicate an answer to, now.

Biology of the biosphere has many successful systems, which are in different stages of life. The most successful and the best evolved is the rain forest. Of course the geography, i.e. longitude, latitude and altitude of the environment and space impact the conditions and possibilities for evolvement and management of life. Second to these conditions is availability of water, which in many cases is closely connected with evolvement of the biological system. In many cases the biology of bordering regions between two different environments land/see, fresh water/land etc., include very successful systems like mangroves, corals, coastal sea and ocean waters etc. But the bigger portion of the biosphere is made of oceans and seas (around 70 % of the earth surface are oceans/seas and 97.5 % of all water on the Earth is in the oceans and seas) and they are less researched and more difficult to know in details.

A general biological knowledge may indicate that the best biological systems on the terrestrial surface are the forests, the second are grasslands, and then come the biotopes specialized according to local conditions – swamps and marshes, bush lands, makia/gariga (Mediterranean), mountains, the Sub-artic, Artic and Antarctic regions, rivers and lakes, deserts, etc. In coastal waters of oceans and seas there are corals, mangroves, and many more as biological systems belonging to successful stories.

All natural systems are composed of physical, geographical and biological characteristics, which make a basis for their composition, while the climate change system provides, makes, holds, and guards the living conditions (water, air, temperature) to provide/guard their evolvments. We may explore the past and see the present of these systems, but we cannot see future evolvments, due to many possibilities and influences involved.

Water and food are very interdependent, when we discuss the food production of our civilization. Water is a basic precondition for food production. Due to changes in the biosphere our civilization was replacing water available for food production naturally with



water from other sources – rivers, lakes, artificial accumulations, etc. Actually, by doing so, the food producing environments have become very similar to the artificial systems, and have been moving fast out of the biosphere patterns.

Due to increased demand for food, new areas have been put into exploitation, which have not been used before. The artificial food producing systems entered a long-term use (reactions in the biosphere are taking time as long as they need, since nature always has enough time, or nature does not care for time, etc). The reaction was very much limiting the production ability, and our civilization was forced to innovate technologies for food production and protection (not to forget the profit/money-gaining reasons) of the food production systems. Many pesticides were invented and then innovated. One-sidedness of the purpose of innovation has been resulting in damages within the biosphere that have gone far beyond our ability to understand them, when we commenced to use pesticides. Today the synthetic chemical compounds should better not enter the natural systems, because of their long-term damaging effect on various parts of nature systems such as water pollution, desertification and lost productivity of agricultural lands, etc.

Now we face a large intoxication of the biosphere with pesticides. It is a consequence of lack of consideration of both complexity and complicatedness of our (only!) biosphere.

Due to an exaggerated growth of the needs of our civilization (drinking water, industrial consumption of water, etc.), and demand for agriculture and food production, the water sources in the nature are becoming insufficient. Many innovations were used for solving this problem, of which many have had an impact on the biosphere systems. Let us mention here the exaggerated use of fresh river/lakes waters, resulting in the destruction of underground deposits and lakes of water, and combined with a lack of understanding the physics of the underground water deposits systems, etc.

At present we face large deficit of fresh water sources, and quality of present sources is questionable, due to pollution by synthetic chemical compounds and their long-term effect. Recently, also the influence of hormones and hormone-like substances are becoming more and more important. Today we do not have clean fresh water supply, but fresh water supply, of water quality within the limits of allowed level of intoxication by synthetic chemical compounds and other pollutants. From water supply viewpoint our future does not look nice.

Our civilization's settlements of near past and present (over-concentration of people and self-creation of the fragile environment – mega-cities etc.) has caused the pollution of all waters in such regions, including areas as far as such polluted waters travel. Actually, the pollution has been a combined effect of pollution from city life (countless toxic substances – natural and synthetic chemical products, etc.) ending in the waters from individual kitchen outflows and sinks, toilets and sewage systems, and from the “natural” rivers flows. Secondly, the usual agriculture intoxicates lands and underground waters and further waters connected with intoxicated lands and underground waters. Finally all this is ending into coastal sea and ocean waters, which are in different stages of pollution/intoxication.

Our civilization has used/uses rivers as sewerage transport system. To achieve the combined effects of the protection of human settlements, citizen's properties, and civilization's achievements against the natural river waters floods, huge hydro constructions were introduced. Actually, by our civilization's standards, we have straightened the natural river flows, and by doing this, we destroyed the natural/biological river waters “filtering” systems.



We achieved a fast running of the river waters, and only this, because we did not protect civilization settlements and achievements against floods. In the long-term the floods are still there, but with a much more damaging effect. A majority of the rivers need eco-remediation of their natural abilities to host life and other qualities destroyed by our civilization.

A further topic with a comparable destiny tackles estuaries and coastal waters, which in many cases were reconstructed into businesses, settlements, and tourist resorts with poor natural biosphere characteristics. They are opening new frontiers for pollution of coastal waters and as a consequence the oceans/seas waters are getting more and more pollution by synthetic chemical compounds and other pollutants.

Today a larger share of human population of our civilization than ever lives on coastal lands. The pollution of coastal waters is taking place, and soon we shall be able to read results of our continuous action damaging the quality of sea and ocean waters. They will be unpleasant.

With our civilization constructions and developments more and more land is changing natural characteristics. At present in Europe land use distribution is: 47 percent agriculture, 36 percent forestry and 17 percent constructions and developments or sealed⁴¹ land, lost forever for the Nature/Biosphere.

The data briefed here make us conclude that many individuals and organizations need to learn and apply system/holistic, actually a requisitely holistic thinking/behavior. Both the past and present experiences of our civilization's impact on a large number of natural systems are calling for more effective nature, space, and environment protection from members of our civilization. In reality, we need diffusion of the requisitely holistic thinking for a broader impact towards better and more suitable behavior, in order to attain our civilization's long-term responsibility and preserve our nature of our Earth/Biosphere rather than to suffer a global tragedy of our commons.

The climate change system operates under preconditions given by the dynamic evolvement of physics, geography, and biology of the Earth and its environment. The humans, with their life practice over the last 300 years of industrial and post-industrial civilization, have been proving their ability to influence constructively and destructively their natural environment, and are going beyond the border of a sustainable life and its long-term influence on the biosphere of the planet Earth. Our findings exposed in our book "System Thinking and Climate Change System" demonstrate that the human impacts on the planet Earth's biosphere system are both individual and organizational, and their consequences are individual, local, organizational, regional, national, international, continental, global, and perhaps even universal. Therefore the selected problem is how to attain a better and more systemic long-term responsibility of humans to humans, including the one via nature. The selected viewpoint considers the potential political measures toward this responsibility. It would be proper to think that the Age of Globalization is asking for a new approach⁴².

The climate change system as an integral part of the Earth biosphere is not its creator, but its provider, maker, holder and guardian of the living conditions. Humans have to find a new

⁴¹ Sealing of lands is process of putting human eco-sphere in human rather than natural order, or constructing and building living environments for humans and livestock, constructing infrastructure, industry and other facilities, churches and religious centres, education and sport facilities etc.

⁴² New approach has been researched by Prof. Dr. Slavko Kulic, IOM, from Zagreb, Croatia, and his research has been done many years ago, but it is still waiting for its implementation.



path towards sustainability or sustainable future, which will provide for more holistic mutual relationship of this civilization and the planet Earth in the newly evolved conditions. The sustainable future of humankind could be defined by “harmony of the present civilization with the nature of the planet Earth”⁴³.

Knowledge creators and its users, sciences, basic and applied research professionals, development specialists, society, and all governing, economic, national, international institutions/subjects, etc. need to accept a broader – requisitely holistic – view at the given evolvments in our biosphere, and to respond adequately to their new challenges.

The present pollution on the global scale (synthetic chemicals, nuclear etc. technologies, CFCs and similar substances, pesticides, genetic modifications, hormones-like substances from our civilization’s synthetic chemical production and medication, technologies’ impact – combustion engines and others, transport equipment, armaments and other war equipments, PCBs with impact on gene structure, etc.) reflects samples of our civilization’s short-term and narrow-minded behavior. What we need for our sustainable future is our long-term social responsibility for our civilization’s impact within the biosphere; it impacts us via nature.

Here we have to distinguish the impacts of the ruler of our civilization – money or profit motive – from the understanding of it and the actual damages done by by-products caused by the lack of knowledge and holism. In many cases of global pollution the profit motive of our civilization was the main reason for large pollution – PCBs, CFCs, pesticides, plastics, etc. – which were and are produced, promoted, and marketed as improvements, but have resulted in damages in our own living space or environment. Cases include the population’s explosive reproduction, and pollution of the atmosphere.

We need research, understanding and values/culture/ethic/norms supporting the long-term responsibility of our civilization in order to stop the irresponsible behavior of the present rulers in economies and societies, the humans. Our civilization’s products such as the one-sided profit system, which causes a failure of understanding of the long-term responsibility, and hence causes irresponsibility, are detrimental to our-selves, at least in a longer term.

The present status of the biosphere, nature, space and the environment, as well as the scientific and research knowledge available to humankind, but not applied on a requisitely holistic basis of behavior, and our social system, are driving our civilization in a dead alley: the short-term and narrow-minded views are favored too much. Individual, regional, national and international interests do not permit humankind to take a new – requisitely holistic – approach to survival by their social, financial, political, and bureaucratic pressures, war/redistribution rather than creation-oriented philosophy, and lack of tolerance between people.

We, the people of the Earth, have to recognize the need for action towards the establishment of an honest and requisitely holistic world constitution, world parliament, and world government as a possibility for our survival, with responsibility to co-ordinate social issues, and to harmonize the needs of the entire humankind, and the nature, space, and environment capabilities, needs, and possibilities. Age of globalization is asking for new – requisitely holistic – approaches and behavior.

Co-ordination of important issues for the Earth/Biosphere by a united single government could

⁴³ Taken from the book “The Sustainable (Development) Future of Mankind”, Ecimovic et al., ISBN 978-961-91826-2-8, 2007, displayed at www.institut-climatechange.si



respond to research results by practical application of them and requisitely holistic and honest rather than one-sided and biased relationship between our civilization and the Biosphere. At list we may have proper management of important issues with more or less good possibility for success. Global direct democracy (but not money democracy) could be proper recommendation for entering age of globalization with a sustainable future of humankind by global governance.

The present practice on the Earth such as:

- The destruction of nearly all waters with synthetic chemicals, bio and air (rain-induced) pollution,
- The destruction of air by the land, sea, and air traffic,
- The destruction by the results of war actions,
- The destruction of the ozone layer,
- Destruction of the soil fertility by the agriculture practice, including erosion and desertification,
- Global warming and other impacts from the climate change system,
- The explosive reproduction of humankind, and
- Diminishing motives for hard work and creation on the part of the affluent minority of population, because affluence has always caused the cult of laziness and hence destruction.

All of these and similar attributes should be parts, which have to undergo transition, changes, researching, learning and requisitely holistic approaches for a better tomorrow of all and survival of the current civilization.

The given practice cannot be dealt with by simply taking narrow-minded and short-term oriented individual, local or national interests into account and meet them in mutual isolation. The crucial ones should be a major responsibility of the world government.

The climate change system, which provides, makes, holds, and guards the living conditions in our biosphere, needs special scientific research, and world governing action. Nature, space, and environment protection by and from members of our civilization, which should take care of the biosphere, need special scientific research and world governing action, too.

Both groups of topics are two global systems reacting to the human one-sidedness by causing global entropy tendencies, which require a global level of the requisite holism in humankind's dealing with them.

The necessary scientific and applied research to cope with the above issues cannot be provided on the basis of our civilization's current scientific and research practice and capacities, due to the engagement of scientists with armaments/war and other misuse/abuse efficiency development, and the demands of bureaucracy.

Therefore, a new approach is needed for a redirection of scientific work towards the needed knowledge and values capable of saving the nature, science, and the environment including the climate change system – for humankind to survive.



14. The Requisite Holism – a Way to overcome the Blind Alley of Today

Scientific work, as a basic source of knowledge, needs special co-ordination at the world-wide level and should be an integral part of the world governance, but a requisitely holistic rather than a biased one. We need independent scientists, who work because of their scientific thinking/acting and practicing ability, and not because of need for daily/monthly/annual salary given to them by bureaucracy (democratic profit-based/dependent societal system), or narrow-minded and short-term focused marketing/profit oriented economy. The money system today has become a master of its own, a monster which rules the entire civilization. It would be nice to put it back, in the frame where it belongs – the servant of humankind. Now, profit is killing profit by causing side-effects having crucial impacts, including humankind's cost covered by company taxes or piled up to be covered in near future in huge sums and tough consequences.

It is obvious that corporate social responsibility is not a part of present mankind ethics, but declarations for promotion purposes only, mostly. When and if the corporate social responsibility and the individual social responsibility of humans will be a part of each and one representative of our species, the sustainable future of mankind will have better chances to prevail.

To be able to understand the need for world governance, humans should understand the systems within which we exist, and systems that we consist of and that we create. It is important due to the known fact that any system in nature will remain as it is, as long as all systems and relations within it are in a similar mode. Together they make a living system that is trying to be a viable system. If and when any major or minor part of the system moves, changes, whole system will commence to move, change. It is not possible to predict in which direction the system will move, change. This is what is happening with the climate change system. It is maybe the answer to what is faced by human society now.

Otherwise, the climate change system ultimately would change living conditions within the biosphere and nature of the planet Earth so much that our civilization will end.

15. The Philosophy of the Sustainable Future of Mankind

The Abstract

Philosophy of sustainable future of mankind is the search for knowledge and understanding of the nature and meaning of the universe and life. The knowledge is most important achievement of Homo sapiens present civilization.

Under the progressing the threat of the impact of the climate change system to the biosphere of the planet Earth, which is changing living conditions, our civilization has to meet the challenges and establish a path for long term survival.

Present global social order, life style, education, ethics and daily practice of humans needs to undergo a fundamental renewal to meet the needs for long term survival during and after the third millennium.



The discussion presents a contemporary sciences approach to the present the *Nature, energy, drinking water, food, credit and societal crisis* of humankind at 2009. The present civilization or our humankind is facing the largest complex societal crisis, which is also closely inter-related with the impact of the climate change system or evolving planet Earth Biosphere »crisis«.

The impact of the climate change system may in the long run change: biology, geography and living conditions within the biosphere, from suitable ones of the last 12.000 years, to environment not suitable for Homo sapiens to live. It is making more complicated or complex of the present social crisis of: energy, drinking water, food and credit. In 2009 we are entering difficult times for humankind.

The corporate and individual (3.1.; 3.3.; 79.) social responsibility is a part of our society with much more importance as we are thinking at present. The possibility for survival is closely connected with social technology/technique of the »Sustainable Future of Humankind« or harmony of our civilization with the Nature of the planet Earth⁴⁴. The corporate and individual social responsibility will have to play a more important part in future, for new great achievement of our civilization to overcome the crisis of living conditions within the biosphere of the planet Earth and present credit, energy, drinking water, food, and credit crisis of our global community.

The sustainable future of mankind or harmony of our civilization with the nature of the planet Earth is an option for mankind to survive approaching impact of the climate change system at the biosphere of the planet Earth (3; 3.1.; 3.2.; 3.3.).

Key Words

Corporate and Individual Social Responsibility – C&ISR; Globalization; Leadership; New approach; Our civilization; Our common enemy; Philosophy; Present Humankind Civilization; Sustainable Development; Sustainable Future; System thinking, requisite holism, social and societal technologies; The climate change system impact, energy, drinking water, food, credit and social crisis; The Nature of the planet Earth; World Government; Provisional World Parliament; and Constitution of the Earth Federation.

The Discussion

Ending of the year 2008 opened new horizons for heavy crisis situations of present global humankind civilization. Because of poor leadership of USA in 2000 – 2008 not only USA society but also the whole global society is facing serious social crisis.⁴⁵

Multiple resources and societal crisis is entering an age of the climate change system and its impact as a crisis, which is adding to the complexity of the situation in 2009.

⁴⁴ Please see: Ecimovic et al: The Sustainable (Development) Future of Mankind, 2007, displayed at www.institut-climatechange.si; and Bozicnik, Ecimovic, Mulej et al: Sustainable Future, Requisite Holism, and Social Responsibility, 2008, available at IRDO.

⁴⁵ Please see: Planck Foundation (www.planck.org): Global Future Analysis, 2008, ISBN 978-94-6012-001-5, and Global Resources Analysis by Induscorp, NL; e-mail: volume1@indiscorp.nl



The scenario of USA and the global humankind society entering globalization age or the energy, drinking water, food, credit and societal crisis has been excellently elaborated and presented at Global Future Analysis 2008 by Planck Foundation, www.planck.org.

The second presentation Global Resources Analysis draft version 2008 by Induscorp.nl at volume1@induscorp.nl is reporting on resources at present. Both analyses were managed by excellent researchers' teams.

The brilliant social scientists have been dealing with humankind and its humankind-centric thinking. The teams' complex system thinking and their co-operation with nature scientists enabled a more complex but more truthful analysis.

Actually, what is the missing part is the climate change system's impact and changes in the biosphere (0 – 3.3.; 12-14; 38; 41; 45;), which are going to have broad impact on the present living conditions for all creatures living on the planet Earth.

The group of enthusiastic philanthropist many years ago commenced everlasting path of global human society leadership on direct democracy basis by The World Parliament, The Constitution of the Earth Federation, and The World Government (1-3.3.; 58;).

The issue of the sustainable future of humankind (3.-3.3.).

The question which we are putting forward is the sustainable future of humankind.⁴⁶ The integrated complex system thinking style is needed for analyzing it. Globalization age has its complex issues as they are, regardless humankind does see them or not. Or otherwise very complex issue of the humankind problems of 2008/2009 should be put into the frame of living space/environment of humans – the biosphere, taking into account the simultaneous problems evolving within the biosphere, plus their synergies (3.-3.3.; 78;).

What we are presenting is a broader analysis of more complicated/complex Nature of the planet Earth and global humankind society situation at 2009. As system thinkers we are analyzing statuses of the different origin of both humankind as a system/entity of its own and a part of the planet Earth system – THE BIOSPHERE.

The biosphere, which is the frame within which global humankind civilization has a living space, has evolved the situation of the climate change system impact, during the rise of the Globalization Age.

The Climate Change System⁴⁷ (0.-3.3.; 14.-16.; 32.-35.; 37.-41.; 43.; 45.; 76.; 77.) **provide, makes, holds and guards** living conditions within the biosphere of the planet Earth, it has a more important role as humans were thinking in the past. To these conditions all living creatures must adjust to survive. A number of the extinctions of species, smaller and larger alike have resulted from changed environmental qualities, caused by changes within the climate change system.

⁴⁶ Please see footnote 1 and 3.

⁴⁷ Please see "System Thinking and Climate Change System – (Against a big "Tragedy of Commons" of all of us)", pp149 Ecimovic, Mulej, Mayur, 2002, ISBN 961-236-380-3, and "The Climate Change System – Introduction", pp 35, Ecimovic, Mulej, 2008, ISBN 978-961-91826-5-9, both displayed at: www.institut-climatechange.si



Systemic thinking (0.-3.3.; 39.-40.; 46.; 78.) enables us, better than single specialists alone, to see that the Earth's biosphere is made as a synergy resulting from ***interdependences, interactions and co-operation*** of matter, energy, and information, and has three bases – Water, Land and Air environments.

To be ready for changes, and mitigations due to the climate change system impacts, all of us single representatives of humankind must learn more about the basics of the biosphere and the Nature.

System theory (3.2.; 3.3.) – A tool for humans to understand the climate change

System theory, thinking, synthesis and analysis as researcher tools are allowing researchers to reach beyond the classical science approaches. As thinking process it could define the climate change system in an understandable presentation.

The term system has many contents. Here it will mean to us neither the mental picture about the event or process dealt with nor a usual method of work or a socio-economic or other order nor a network/complex of plants or stones or humans fitting together somehow.

The term system will here rather mean to us a feature/event/process that is so complex in its components, relations and influences between them and their consequences that it is difficult to comprehend and even more difficult to control.

This is why we call the climate change a ***system*** (3.2.; 3.3.). Understanding and/or controlling it per parts is not very helpful, because as a whole a system has attributes that differ essentially from attributes of each one of its parts alone.

And

Life, even survival of us, the modern civilization, depends on conditions provided by the *Nature* in which we human all live, and by the climate change system as an integral part of it.

The Nature, Cosmos/Universe, Milky Way, Solar System, Earth, Biosphere, climate and climate change systems, terrestrial, water and air environments are *no simple systems* (features, entities, and processes), but very complex and complicated.

The time – *duration, continuance (Webster)* as it is accepted, used and understood by humans and our civilization may look completely different from the *nature* point of view. The nature does not recognize our common term “time”.

The climate change system impact is changing living conditions at biosphere of the planet Earth, in general, and is result from natural processes and/or human interventions.

Both kinds of impacts can cause consequences, which are both good and bad by human criteria. E.g. from a rather one-sided/narrow/shallow/oversimplifying viewpoint the changes in the human life over the last 2 – 3 centuries are bringing the so called *progress*: more comfort, a higher standard of living (for part of humanity) on the basis of many technological and non-technological innovations.



Philosophy of sustainable future of mankind is the search for knowledge and understanding of the nature and meaning of the universe and life.

The sustainable future or harmony of global society with the Nature of the planet Earth, and its coexistence with other creatures in nature as a part of the Earth's biosphere is the solution, to the best of our knowledge, which should be adopted as the vision for our survival.

We need a society wide global approach, and not the dilution of scarce financial means, for ***it is impossible to buy the survival of mankind with a financial approach however great.***

With commencement of awakening of mankind in sixties of 20th century, on needed quality of environment, as basis for life of mankind and all creatures on the planet Earth, it is also commencement of sustainable development concept/strategy/vision (50.).

Our collective awakening regarding the difficulties that our Earth faces was excellent; however, it did not change most people's short term values.

The problems of sustainability of mankind and the planet Earth are much more complex than were understood at the end of the 20th century.

The first part of the "sustainable development" (0.-3.3.; 4.-13.; 15.-40.; 43.; 46.; 48.; 50.; 56.-57.; 62.-75.; 77.) – "sustainability", is much more important and has real value for the future of mankind.

Second part, "development" is a term that is often misused from the industrial revolution and world of economics, and has nothing to do with Nature of the planet Earth. When we use the term "development", we are referring to products, construction, man-made systems, repairs, machines, armaments, etc.

Development is a part of human society of post-industrial era. Nature has no "development" whatsoever, and natural system works on contents and under the rules of ***interdependences, interactions and co-operation***⁴⁸ relations and it is always at present.⁴⁹

What is needed is a New Approach⁵⁰ (57.) as the introduction of global society system relations, values, ethics, contents and mechanisms, which should assist as to transcend to a sustainable future of planet Earth's human global community.

What is necessary for the survival of humankind is to introduce the concept of a sustainable future of humankind by attaining harmony with our environment and the nature, since present society have lost touch with the nature.

⁴⁸ ***Interdependence, interaction and co-operation*** as constant engine of the Nature has been described at the book System Thinking and Climate Change System, please see www.institut-climatechange.si .

⁴⁹ System Thinking and Climate Change System – Against a big »Tragedy of Commons« of all of us, 2002, Ecimovic. Majur, Mulej and "The Information Theory of Nature, and", 2006, Ecimovic, are opening discussions for understanding present by our civilization, and this presentation.

⁵⁰ New Approach as needs for restructuring of global society has been introduced by Prof. Dr. Slavko Kulic, IOM, from Zagreb, Croatia, but it is still within science, and is waiting for better time to be understood and used.



Sustainable future of local community leads to the sustainable future of mankind (3.-3.3.).

It would be easy to write at length on the concept of sustainable development, but that is not the purpose of this presentation.

Our purpose is to transcend from sustainable development to sustainable future as concept, policy, technique that is needed for the survival of mankind.

The follow up from sustainable development should be accomplished with all possible co-operation of mankind to sustainable future, and by mitigations of the climate change system impact on the biosphere of the planet Earth.⁵¹

The goal of sustainable future is a most complex issue, which could be undertaken with consent of all humankind and with a real dedication to fulfilling its goals.

It is pertinent at this point to provide a short description of “sustainable future”:

Sustainable future of mankind is harmony of the humankind system/civilization with system of nature/biosphere of the planet Earth.

It is a short description of a very complicated and complex concept of present global human society and its basis – the biosphere of the planet Earth.

I believe that all good work of countless individuals towards achieving sustainable development should now be reoriented to the more complex concept of achieving a “sustainable future”.

However number of important issues have been mentioned, but not to forget, many more of them have not been mentioned. We believe that it is important to understand all simple and complex issues needed for transcend of present global society to sustainable future human society of the third millennium.

People, values and knowledge have been making an epic song of our civilization, which has been going on since humans have existed. And so has other nature, including *whole* Universe; Milky Way; The Solar System; The planet Earth; Biosphere; etc down to fundamental particles – quarks, protons, neutrons, electrons, relativity theory, and the information theory of the Nature, the environment theory of the Nature, quantum mechanics and atom structural understandings. We people are a part of nature, although this has been admitted less over the last three centuries than ever before.

The climate change system ultimately would change living conditions within the biosphere and geography of the Earth so much that our civilization will end.

Therefore we are presenting the climate change system as common enemy of our civilization, and sustainable future concept as path for survival or future of our civilization, and I am

⁵¹ Please see complementary book »Our common Enemy – The Climate Change System Threat« at www.institut-climatechange.si.



16. RECOMMENDING⁵²

One planet, one government is first recommendation. Of course, The Constitution of the planet Earth Federation is first and the planet Earth Parliament and Government follow in line, after ratification of The Constitution of the planet Earth Federation.

Secondly recommendation is a new approach to the *social order*, which has to reflect the present experience, and the establishment of a *new contract for humankind* living on the planet Earth. The goal is to prevent explosion of humankind reproduction, enforce ethics and respect amongst peoples of the Earth, enforces (a globally holistic!) law and order, and with skilful governing allow the coming generations to live and have sustainable future⁵³ on the planet Earth.

Third recommendation is *redirections of scientific work* from innovations of war armaments techniques and technologies for destruction, too narrowly market and money-oriented synthetic chemicals technologies, too narrowly market and money-oriented energy technologies, too narrowly market and money-oriented genetic manipulation techniques, societal management based on money monster - the master practices, etc., to discovering viable global systems of nature, space, the environment and universe/cosmos, as essential elements of knowledge needed for survival and sustainable future or harmony of our civilization with the Nature.

In conclusion: “Be the change you want to see in the world” (Gandhi).

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