3D MODEL LOGIČKE INTEGRACIJE METAFIZIKE I UPRAVLJANJA RIZICIMA OD KATASTROFA

Stručni članak

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Sažetak

Nauka počiva na kontinuiranom preispitivanju dokaza i empirijskim istraživanjima vođenim željom za uspjehom i strahom od neuspjeha, a religija na bezuslovnom prihvatanju izvornih dogmatskih predaja i temeljnih principa vjerovanja u Boga i vječnu nagradu sa istovremenim strahom od Božije kazne. Metafizika kao baza filozofiske naučne misli proučava prirodu stvarnosti i nastanka, postavljajući pitanja o tome šta postoji, zašto, u kom vremenu, u kom prostoru i u kojoj uzročnosti. Upravljanje rizicima od katastrofa je egzaktna naučna disciplina uspostavljena na metafizičkim preispitivanjima uzroka i nastanka pojava i matematičkim modelima predikcije i analize posljedica. Ovaj rad istražuje intrigantnost korelacije logičkih odnosa metafizičkih načela i upravljanja rizicima od katastrofa. Udubljujući se u filozofsko područje metafizike, analiziramo pojmove kao što su neizvjesnost, uzročnost i priroda stvarnosti. Povlačeći korelacijske veze, ispitujemo razvoj logičke matrice uzroka i posljedica za bolje razumijevanje metafizičkih načela koji mogu pravovremeno alarmirati donosioce odluka i poboljšati njihove strategije upravljanja rizicima. Istraživanje međusobne povezanosti temeljnih načela u domeni rizika, uticaja i kapaciteta odgovora na krize, nudi svježu perspektivu rješavanja nesigurnosti i donošenja informiranih odluka u složenim situacijama. Zaključke ćemo definisati analitičko-deduktivnim i sintetičkim metodama uz komparaciju odnosa metafizike i primjenjene nauke u okviru civilizacijskih visemilenijumskih iskušenja kroz koja je prolazio ljudski rod. Od potopa za vrijeme vjerovjesnika Nuha pa do suvremenih kriza i pristupa za rješavanje istih. Radom ćemo na originalan naučni način determinisati rizike, uticaje i kapacitete efikasnijeg odgovora na klimatske i na društveno-političke krize,

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te ćemo izazvati stručno-naučnu javnost da proaktivnije ponudi odgovore na postavljeno pitanje: da li prihvatanje i razumijevanje 3D logičkog modela integrisane primjene metafizike i upravljanja rizicima moze doprinjeti ublažavanju ranjivosti ljudskog roda.

Ključne riječi: Metafizika, Logika, Upravljanje rizicima, Integracija.

1. UVODNE DEFINICIJE POJMOVA

Nauka počiva na kontinuiranom preispitivanju dokaza i empirijskim istraživanjima vođenim željom za uspjehom i strahom od neuspjeha, a religija na bezuslovnom prihvatanju izvornih dogmatskih predaja i temeljnih principa vjerovanja u Boga i vječnu nagradu sa istovremenim strahom od Božije kazne. Na pitanje novinara Time-a 1923. da predvidi razvoj nauke u 21. stoljeću, jedan od najvećih svjetskih naučnika Nikola Tesla je istakao „da ne postoji sukob između ideala nauke i ideala religije, ali je nauka suprotstavljena teološkim dogmama jer se nauka zasniva na činjenicama“. No, nije li i metafizika kao grana nauke zasnovana na proučavanju prirode stvarnosti i nastanka, protkana dogmatskim činjenicama na kojima počiva religijska misao. U eri sve veće zabrinutosti za okoliš i složeni društveno-politički pejzaž, ovaj rad nastoji razotkriti duboke veze između metafizičke misli i naučnog modela upravljanju rizicima povezanim s klimatskim i androginim katastrofama. Analizom osnovnih metafizičkih koncepata, naš cilj je ponuditi jedinstvenu perspektivu rješavanja neizvjesnosti i donošenja informiranih odluka. Poređenje metafizike, upravljanja rizikom od katastrofa i primijenjene matematike uključuje razmatranje njihovih različitih područja fokusa, metodologija i primjena.

1.1. Metafizika

Metafizika je grana filozofije koja se bavi razumijevanjem postojanja i fundamentalnom prirodom stvari. Postavlja pitanja o tome šta postoji, prirodi objekata, vremenu, prostoru i kauzalnosti. Metafizika je više teorijska i apstraktna, bavi se pitanjima koja su često izvan fizičkog mjerenja ili naučnog testiranja. Kako u svom radu navodi Agassi (1981.) prema prijedlozima Descartesa i Roberta Boyla "tradicionalno, uloga metafizičkih principa bila je da generišu pravila za naučna istraživanja." Za jednog od pionira logičkog promišljanja o povezanosti metafizike i matematičkih modela egzaktne nauke, smatra se engleski matematičar, filozof i metafizičar Whithead (1923), koji ustvrđuje da se Aristotela sa punim pravom može smatrati i najznačajnijim filozofom metafizike. Whithead ističe da je Aristotel našao nužnim upotpuniti svoje pojmovno shvatanje metafizike uvođenjem “Prvog Pokretača – Boga”. Zbog dva je razlog ova činjenica važna u povijesti metafizike. Na prvome mjestu, nema sumnje da je Aristotel bio jedan od najznačajnijih metafizičara u povijesti, uzimajući u obzir njegovu genijalnost uvida, opće bogatstvo njegovog znanja, i poticaj njegovih metafizičkih predaka. Drugo, tokom razmatranja ovog metafizičkog pitanja, on je bio u potpunosti lišen strasti, a njegova filozofska razmišljanja su u svojoj bogatoj recepciji bila i ostala glavno izvorište različitih metafizičkih objašnjenja i fundiranja stvarnosti. Jedan od njegovih učenika, Conger, (1927), u svojim bilješkama citira svoga učutelja kako je rekao: "Svaki naučnik, da bi sačuvao svoju reputaciju mora da kaže da ne voli metafiziku. Ono što on misli je da ne voli da se njegova metafizika kritikuje." Po Vajthedovom mišljenju, naučnici i filozofi postavljaju metafizičke pretpostavke o tome kako univerzum funkcioniše svo vrijeme, ali takve pretpostavke nije lako uočiti upravo zato što ostaju neispitane i neupitne. Dok Whithead priznaje da se "filozofi nikada ne mogu nadati da će konačno formulirati ove metafizičke početne principe," on ujedno tvrdio da ljudi moraju stalno iznova zamišljati svoje osnovne pretpostavke o tome kako univerzum funkcionira ako filozofija i nauka žele ostvariti stvarni napredak, čak i ako taj napredak ostaje trajno asimptotičan. Iz tog razloga, Whithead je smatrao da su metafizička istraživanja neophodna i za dobru nauku i za dobru filozofiju. Ima mnogo primjera vrhunskih naučnika koji su u tajne konekcije nauke i metafizike, od kojih posbno treba istači Nikolu Teslu koji je proučavajući pojave, relacije, energiju i vibracije u Svemiru u potpunosti se predao asketskom životu i vjerovanju u postojanje

1.2. Upravljanje rizicima od katastrofa

Prema definiciji Kancelarije za smanjenje rizika od katastrofa pri Ujedinjenim Nacijama (UN DRR), upravljanje rizicima od katastrofa je primjena politika i strategija za smanjenje rizika od katastrofa, u cilju sprječavanja novih rizika od katastrofa, smanjenja postojećih rizika od katastrofa i upravljanja preostalim rizikom, doprinoseći jačanju otpornosti i smanjenju gubitaka od katastrofa. Upravljanje rizicima od katastrofa je neizbježni i sastavni dio cjelokupnog naučnog diskursa, koji se bavi identifikovanjem i ublažavanjem rizika povezanih sa prirodnim katastrofama i katastrofama koje je prouzrokovao čovek. Uključuje

planiranje, organizovanje i sprovođenje mjera za sprečavanje, reagovanje i oporavak od katastrofa. Ovo polje je vrlo praktično i uključuje mnogo aktivnosti na terenu, analizu faktora rizika i implementaciju strategija za minimiziranje štete.
Evropska Komisija je od 2015.godine započela sa aktivnostima "Centra znanja za upravljanje rizicima od katastrofa (DRMKC) koji je pripremao izvještaje u vodećoj seriji „Nauka za upravljanje rizicima od katastrofa". Objavljena su dva izvještaja, prvi u maju 2017. Godine i drugi krajem 2020. godine, s podnaslovom „Znati bolje i gubiti manje". Oba izvještaja su se nadovezivala na svoje uspješne rezultate i učeći iz svog multisektorskog i multidisciplinarnog procesa umrežavanja (koji je uključivao preko 270 saradnika). Izvještaj Nauka za DRM 2020., je učinio korak dalje u jačanju sučelja nauke i društva, fokusirajući svoju analizu na uticaje katastrofa na različite sektore ljudskog života i aktivnosti. DRMKC podržava jačanje saradnje između naučnika, kreatora politike, praktičara i građana, te dalje jačanj upotrebe dobrog znanja za efikasnije komuniciranje i upravljanje rizicima od katastrofa. Izvještaj Nauka za DRM 2020: djelovanje danas, zaštita sutra traži konkretna inovativna rješenja – krećući se od identificiranja potreba do identificiranja rješenja. Na osnovu evropskog opsega DRMKC-a, teme koje su obrađene u Izvještaju upućuju se prvenstveno evropskoj publici, ali su one univerzalne i slijede Platformu Ujedinjenih Nacija za smanjnje rizika od katastrofa (UN DRR). Isto tako, dokument bi razmotrio sve faze ciklusa upravljanja rizicima od katastrofa i uticaje katastrofe, naglašavajući dodanu vrijednost zajedničkog sticanja znanja, uključujući sve relevantne discipline, sektore i dionike, te prepoznajući da se akcije rizika od katastrofa provode na različitim načinima upravljanja. nivoi: lokalni, podnacionalni, nacionalni i na kraju, evropski.

1.3. Logika

Grčki filozof Aristotel iz IV stoljeća p.n.e. prvi je koristio varijable za predstavljanje logičkih izraza. U Srednjem vijeku se Aristotelova deduktivna logika nadograđivala, sve do XVII stoljeća, kada engleski filozof Francis Bacon uvodi induktivnu logiku, predstavljajući je „instrumentom naučnih istraživanja", kako to ističe Joseph, D., (1902). U XIX i XX stoljeću razvija se matematička logika, zasnovana na radu Gottfried Wilhelm Leibniz-a, njemačkog filozofa i matematičara, koji se proučavajući djela Galilea, Francis Bacona, Thomas Hobbes i René Descartes pokušavao pomiriti ove moderne mislioce sa Aristotelovom metafizičkom skolastikom[1].

Baveći se metafizikom i logikom, Leibniz se istakao po svom nezavisnom pronalasku diferencijalnog i integralnog računa. Istaknuti predstavnici njegove škole su bili Rudolf Carnap, Bertrand Russell i Alfred Tarski. Njihova logička promišljanaj su koristil poseban sistem znakova (slično matematičkim) sa striktno određenim značenjima. Ovakav sistem znakova je bio donekle ograničen u primjeni na složenim pojavama izražene dinamike, kao što su prirodne i društvene pojave. Nakon pojave matematičke, razvija se i simbolička logika, koja je na početku bila samo razvijeniji oblik deduktivne logike a kasnije je obuhvatila i induktivnu logiku. Ova logika je šira i egzaktnija od tradicionalne.

Danas, logičke matrice predstavljaju jedan od nosivih stubova primijenjene matematike i razvoja matematičkih metoda i modela koji se koriste za rješavanje praktičnih problema u nauci, inženjerstvu, biznisu i drugim oblastima. Sama primjenjena matematika predstavlja spoj teorijskog znanja i praktične primjene. Primijenjeni matematičari razvijaju matematičke modele, analiziraju podatke i koriste statističke tehnike za rješavanje problema iz stvarnog svijeta.

Svaka od ovih disciplina koristeći različite metodologije služe različitim svrhama.

Metafizika se u velikoj meri oslanja na logičko rezonovanje i filozofsku raspravu. Dok upravljanje rizicima od katastrofa koristi kombinaciju praktičnog planiranja, kreiranja politika i praktičnih strategija upravljanja. Primijenjena matematika, s druge strane, stavlja naglasak na matematičko modeliranje, statističku analizu i primjenu matematičkih teorija za rješavanje specifičnih problema.

Iako se ove naučne discipline razlikuju po svojim pristupima i područjima fokusa istraživanja, nesumnjivo da dolazi do njihovog čestog preklapanja, posebno između primijenjene matematike i upravljanja rizikom od katastrofa. Na primjer, matematički modeli su ključni u predviđanju scenarija katastrofe i u formulisanju efikasnih strategija upravljanja. Metafizika, s druge strane, iako manje vidljivo direktno povezana, nudi dubok uvid u razumijevanje pojmova kao što su rizik, uzročnost i priroda ljudskog donošenja odluka, što direktno i indirektno utječe i na upravljanje rizicima od katastrofa i na primijenjenu matematiku.

[1] *Gottfried Wilhelm Leibniz, born in Leipzig1646, died 1716 in Hanover, Germany. https://www.britannica.com/biography/Gottfried-Wilhelm-Leibniz*

2. NAUČNI PRINCIPI I METODOLOŠKI OKVIR

2.1. Naučni principi

Polazeći od principa da je metodologija naučna disciplina koja proučava puteve naučne spoznaje (Žugaj, Dumičić i Dušak, 2006), možemo reći da je ona put kojim nauka treba kročiti (Čendo-Metzinger i Toth, 2020).
Da bi smo pravilno razumjeli korelacije metoodoloških okvira definisanih naučnih disciplina trebamo najprije definisati pojam nauke i njene osnovne principe. Čendo-Metzinger i Toth (2020) nadalje navode da je nauka sistematiziran i argumentiran skup znanja o objektivnoj stvarnosti u određenom povijesnom razdoblju do koje se došlo primjenom objektivnih znanstvenih metoda. U tom smislu, možemo reći kako nauka ima pet osnovnih ciljeva: opisivanje pojava kojima se bavi, klasifikacija, objašnjenje, predviđanje i kontrola (Vukosav i Zarevski, 2011).
Autori Žugaj, Dumičić i Dušak (2006) sistematiziraju osnovne karakteristike znanosti: društveni karakter znanosti, jedinstvo teorije i prakse, kreativnost u znanosti, internacionalnost znanosti i znanstveno istraživanje i primjenu znanstvene metode. Društveni karakter znanosti odnosi se na njezinu univerzalnost i težnju služenju interesima i napretku cjelokupnog čovječanstva. Jedinstvo teorije i prakse u znanosti podrazumijeva stalnu isprepletenost teorije i prakse, odnosno, prakse koja se oslanja na znanost i znanosti koja se potvrđuje kroz praksu. Kreativnost u znanosti odnosi se na stvaralaštvo i kreativnost znanstvenika.
Znanstveno istraživanje i primjena znanstvene metode podrazumijeva sustavno traganje za znanjem i razumijevanjem pojava i činjenica u okolini uz pomoć znanstvenih metoda. Internacionalnost znanosti označava kako se znanost ne može svesti u uske nacionalne okvire već je ona općeljudska po svojoj prirodi i društvenoj ulozi. Osim osnovnih karakteristika nauke, naučnu djelatnost karakteriziraju objektivnost, pouzdanost, preciznost, analitičko - sintetički postupak, sustavnost i racionalnost (Žugaj i dr., 2006).

2.2. Metodologija

Metodologija ovog rada je obuhvatila, analitičko-sintetičke, induktivno-deduktivne i statističke metode, kao i metode deskripcije i komparacije
Analitičkom-sintetičkim metodama smo najprije raščlanili složene elemenata

metafizičkih pojava i pojmova upravljanja rizicima od katastrofa na jednostavnije dijelove koje smo zatim spajanjem povezali u složenije misaone tvorevine, odnosno u integrisanu logičku cjelinu.

Induktivnom metodom smo od poznatih pojedinačnih historijskih primjera zabilježenih katastrofa donijeli opće zaključke korelacija metafizike i upravljanja katatsrofama. Metoda indukcije nam je omogućila spoznaju novih činjenica i zakonitosti na temelju pojedinačnih slučajeva i saznanja.

Dedukcijom smo polazeći od općih stavova i načela došli do pojedinačnih spoznaja. Sagledavanjem cijelokupne pojavne slike dolazimo najprije do suda zdravorazumne logike da se sve u prirodi i oko nas dešava s preciznim određenjem definisanim vjerovatnoćom i određenim uticajem na ljude i okolinu. Posebnu spoznaju predstavlja saznanje da se spremnost na katastrofe treba uzeti u obzir u preciznijoj determinaciji algoritma za izračun matrice rizika

Koristeći analitičko-sintetičke i induktivno-deduktivne metod, donosimo zaključke koji sintetiziraju uvide iz metafizike i upravljanja rizikom. Ovakav integrativni pristup ima za cilj da pruži holističko razumevanje efikasnih strategija za ublažavanje ranjivosti u uslovima klimatskih i društveno-političkih kriza. Upustajući se najprije u rigorozno istraživanje metafizičkih principa, seciramo njihove implikacije na razumijevanje neizvjesnosti, uzročnosti i prirode stvarnosti.

Primjenom statističke metode na temelju obilježja određenih skupina (uzoraka) prikupljenih naučnim istraživanjima, historijskim ili dogmatskim učenjima, zaključujemo o zakonitostima i pravilnostima različitiv vrsta skupova (populacijski, materijalni, okolišni, itd.)

Deskripcijom metafizičkih pojava i različitog pojmovnog shvatanja katastrofa, postavljamo teze za raspravu oko njihovih međusobnih veza i odnosa, koje mogu biti sa, ali i bez naučnog objašnjenja i tumačenja. Komparativnom metodom pokrećemo postupak uspoređivanja istih ili sličnih metafizičkih pojava kojima nas uče dogmatske norme ali i zdravologički principi zasnovani na historijskim činjenicama, nakon čega pristupamo utvrđivanju matrice njihovih sličnosti i razlika.

Propitujući paralele između metafizičkih principa, logičke matrice i strategije upravljanja rizicima, cilj nam je otkriti obrasce koji mogu doprinijeti nijansiranijem i efikasnijem pristupu za ublažavanje uticaja klimatskih i androgenih katastrofa na ljude, ekonomiju i životnu sredinu. Razmatrajući pojedinačni metafizički metodološki okvir postavljamo osnovu za naknadno ispitivanje primjenjivosti logičkog modela u cilju efikasnijeg upravljanja rizicima od katastrofa.

Integrisani metodološki okvir koji proučavamo definiše inovativnu trodimenzionalnu perspektivu međusobno povezanih korelacijskih nivoa, koji nam omogućavaju integrisano upravljanje riicima od katastrofa. Prvi nivo u razvoju integrisane metodologije podrazumijeva metafizičko razumijevanja prirodnih i androgoških pojava i uzroka kriza. Drugi nivo je baziran na razvoju logičke matrice za identifikaciju, analizu i vrednovanje rizika. I treći nivo podrazumijeva izgradnju politika za jačanje kapaciteta prevencije, spremnosti i odgovora za smanjenje rizika od katastrofa.

Proučavanje inovativnog trodimenzionalnog modela međusobnih korelacija predstavlja napredniji pristup traganja za životnim odgovorima na skali uspješnosti između duhovnosti i nauke. Ova korelacija u svojoj fazi razumijevanja doživljava logičku katarzu jer sve što ima duhovnu determinaciju ima i svoju određenu materijalizaciju koja u naučnom smislu podrazumjeva ravnotežu izračuna u jednadžbi sa jednom ili više nepoznatih.

3. TEMELJNI PRINCIPI I ISTORIJSKI KONTEKST

3.1. Temeljni principi

Istražujući međusobnu povezanost temeljnih principa i istorijskog konteksta metafizike sa upravljanjem rizicima, nastojimo uspostaviti logičku matricu razumijevanja filozofije religijske misli, koja može poboljšati našu sposobnost razumijevanja pojava, predviđanja događaja i rješavanja neizvjesnosti donošenja informiranih odluka u složenim i kriznim situacijama, kao što su iznenadne prirodne i druge katastrofe.

F.W. Waters u knjizi The Way In and the Way Out (1967) i Alastair McKinnon u Falsification and Belief (1970) sugeriraju sličnosti između nauke i religije: obje uključuju pogrešne i ograničene pokušaje primjene temeljnih principa. Ali ovi principi sami po sebi nisu nesigurni. Stoga, tvrdi McKinnon, naučnik, posvećen principu da svijet ima poredak, a vjernik, posvećen vjeri u Boga, moraju pokušati pokazati da iskustvo i život postaju razumljivi razumnom primjenom dotičnog principa. Religija i istina Donalda Vibea (1981.) je molba da se religijsko znanje shvati ozbiljno – čak i da se od tog znanja stvori odgovarajuća nauka. On priznaje da je vjerska istina vrlo složena, ali vjeruje da istina i neistina treba da budu centralna briga naučnika u ovoj oblasti. On snažno osuđuje tendenciju učenjaka u religiji da opisuju vjerovanja, a da ih ne procjenjuju (Armour, L., i dr. 2012)

Rubinoff, (1970), je argumentirao u prilog britanskom filozofu R.G. Collingwooda da naše naučne i druge, poglede na Svijet, moramo posmatrati u

kontekstu pretpostavki s kojima ljudi pristupaju. Metafizički sistemi i religiozni pogledi na Svijet mogu se smatrati razumljivim ako se uzmu kao prikazi načina na koji je ljudski um u stanju da vidi Svijet u različitim vremenima. U toku istorije, ovi promenljivi pogledi počinju da otkrivaju obrazac, koji je Rubinof nazvao "transcendentnom strukturom stvarnosti", tj. strukturom koja se pojavljuje kroz, ali na kraju vodi izvan neposrednosti ljudskog iskustva.
Armour, L., i dr., (2012), ističu da je postojao značajan interes za prirodu religijske prakse i religijsko iskustvo, gdje se filozofija koristi kao oruđe za razumijevanje, ali ne i izaziva religijsko uvjerenje.

3.2. Istorijski kontekst

Pa tako sagledavajući višemilenijumske izazove kroz koje je prolazila ljudska civilizacija, analiziramo i kompariramo istorijske primere kao što je bio Nojev potop, sa savremenim katastrofama koje su pogađale čovječanstvo u posljednjih nekoliko stoljeća. Ova istorijska perspektiva pomaže u identifikaciji obrazaca, odgovora i evolucije društvenih pristupa katastrofalnim događajima. Sa aspekta religijskih učenja, svi su Božji vjerovjesnici bili odlikovani najboljim ljudskim epitetima i počašćeni Božijim darom da mogu predviđati situacije i obavještavati svoje narode pripremajući ih za nadolazeće krize i katastrofe. U islamskoj svetoj knjizi objavljenoj poslaniku Muhamedu se navodi: "Mi smo Nuha narodu njegovu poslali i on je među njima ostao 1000, manje 50 godina, pa ih je potom zadesio potop, zato što su Allahu druge ravnim smatrali. (Kur'an, 29:14) U Bibliji, u poglavlju Genesis 6:9, ovaj događaj se opisuje na sljedeći način: Gospod je tada rekao Noi: „Uđi u arku, ti i cijela tvoja porodica, jer sam te našao pravednog u ovom naraštaju. Uzmite sa sobom sedam parova svake vrste čiste životinje, mužjaka i njegovog partnera, i po jedan par svake vrste nečiste životinje, mužjaka i njenog partnera, kao i sedam parova svake vrste ptica, mužjaka i ženke, da ih čuvate njihove različite vrste žive širom zemlje. Za sedam dana poslat ću kišu na zemlju četrdeset dana i četrdeset noći, i zbrisat ću s lica zemlje svako živo biće koje sam stvorio."
I u antičkoj Grčkoj, su promišljali o katastrofama, pa tako Sandin, P., (2002), navodi da uprkos iznenađujućoj oskudnosti akademskih filozofskih rasprava o ovoj temi, katastrofa – ili potencijal katastrofe – bila je prisutna u zapadnoj filozofiji od njenih ranih dana. Na primjer, u Timeju i Kritiji, Platon pripovijeda mit o Atlantidi gdje je katastrofa zadesila nekada moćno kraljevstvo: „Ali kasnije su se dogodili strašni potresi i poplave, i zadesio ih je jedan teški dan i noć, kada

je cijelo tijelo vaših ratnika progutala zemlja, a ostrvo Atlantida na sličan način progutalo je more i nestao; stoga je i okean na tom mjestu sada postao neprohodan i neistraživ, zakrčen plićakom koji je ostrvo stvorilo dok se slagalo“. (Platon 1925, 25c–25d)

Slični eshatološki mitovi prevladavaju milenijumima u kršćanstvu kao i u drugim religijskim tradicijama. Ključna tačka u ovom razvoju, i ona koja možda označava početke modernog filozofskog bavljenja katastrofama, je potres u Lisabonu 1755. godine. On se dogodio ujutro 1. novembra, u vrijeme kada su mnogi stanovnici grada prisustvovali misi. Naročito je oštećeno središte grada, u kojem je stanovalo plemstvo (Dynes 2000).

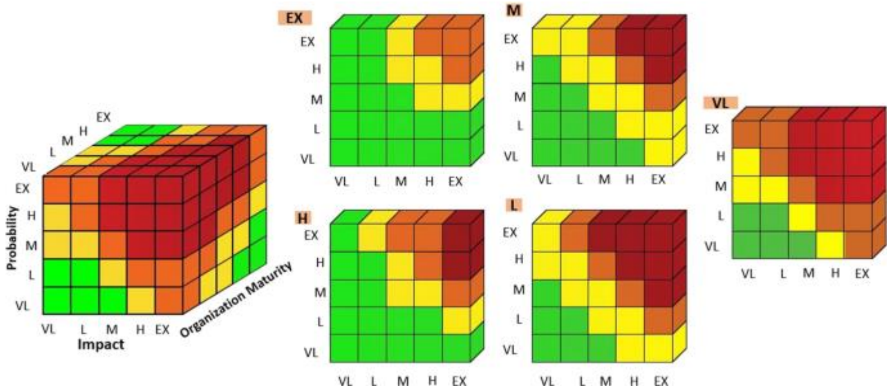
U nedavnom radu, Paul Voice (2016) nudi relevantnu kategorizaciju područja u kojima bi se filozofi mogli baviti katastrofama. Prvo, postoji skup metafizičkih i u nekim slučajevima teoloških pitanja. To je ono što je zabrinulo filozofe u traženju odgovora na pitanje „šta je katastrofa?“ Drugo, postoji etički pristup, koji se uglavnom bavi pojedincima i njihovim postupcima. Tu spadaju i primijenjena etička pitanja kao što su odgovornosti zdravstvenih radnika u situacijama katastrofe, pitanja ratnih trijaža stradilih i tako dalje. Treće, tu je političko-filozofska perspektiva, koja se prvenstveno bavi institucijama, a ne pojedincima, s pitanjima poput toga koje mjere prinude država opravdava poduzeti u situaciji nakon katastrofe.

4. 3D Logički model upravljanja rizicima

Prije nego se upustimo u sintetičku analizu Garaplija (2018) navodi da se konvencionalno dvodimenzionalno poimanje Matrice rizika svodi na determinaciju vjerovatnoće i uticaja kojima se određeni rizik definiše u nekom od svojih pojavnih oblika, kao što su prirodne katastrofe (zemljotresi, poplave, požari, pandemije itd.) ili nesreće izazvane ljudskom namjerom (ratovi, terorizam, sabotaže) ili ljudskim nemarom. Ovakva definicija Matrice rizika je identična i izračunu matrice rizika datom u standardu za upravljanje rizicima ISO 31000.

*Risk = Hazard Impact * Probability*

Međutim, razvojem različitih modela upravljanja rizicima u stvarnim situacijama rješavanja kriza uzrokovanih prirodnim i drugim katastrofama u posljednje deseteljeće, evidentna je manjkavost konvencionalnog pristupa upravljanja rizicima u kojem precizniji izračun preventivnog faktora „P“. Mnoge organizacije u zemljama u razvoju počele su da stavljaju snažan prioritet na upravljanje rizikom. Stoga su naučnici istraživali novi model koji uključuje organizacijsku zrelost kao novu dimenziju u procjeni rizika projekta. U svojoj metodologiji istraživanja, koristili su hibridni sistem zasnovan na fuzzypravilima (BWM-FRBS) u kombinaciji sa 3D matricom za procenu verovatnoće rizika i matematičkim jednačinama generisanim za organizacioni uticaj i zrelost. Hayder, R. A., Hatim, A., (2023), navode da s obzirom na mogućnosti unapređenja izgradnje i rada projekata u obnovi Iraka, kod investitora i izvođača se pojavila potreba za novim, efikasnijim pristupom upravljanju rizicima prilikom rekonstrukcije kritične infrastrukture. Nakon analize nekoliko istraživačkih studija, stručnjaci su formirali početnu strukturu procjene rizika i potvrdili konačne komponente parametara modela. Težine komponenti izračunate su BWM tehnikom. Pripremljene su jednačine uticaja i organizacijske zrelosti. Izlazi prethodnih jednačina i vjerovatnoća pojave su zatim korišteni kao inputi za FRBS model za određivanje ocjene rizika. Ovaj model je koristio 3D matricu rizika za konstruisanje fuzzy pravila koja se mogu vidjeti na slici 1 ispod. Irački građevinski projekti korišteni su kao studija slučaja za validaciju integriranog modela. Prelazak na 3D hibridni model pokazao se efikasnijim i preciznijim od ranijih 2D konvencionalnih tehnika za procjenu rizika i određivanje prioriteta i može pružiti kritične informacije za upravljanje rizikom.

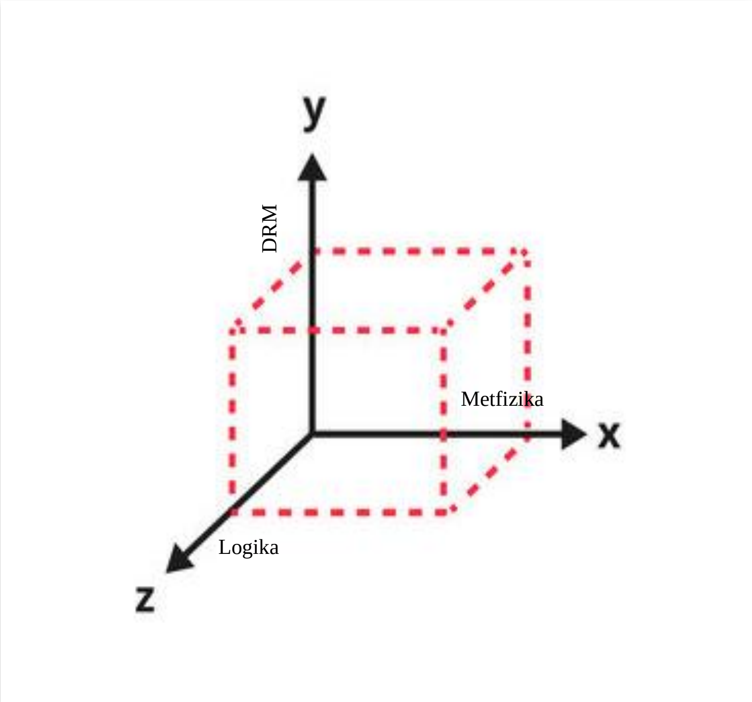


Slika. 1. BWM – FRBS model of the risk score matrix

Dodatno raščlanjujući unaprijeđenu 3D Matricu rizika Garaplija (2023) umjesto općeg pojma zrelosti organizacije, uvodi egzaktniji izračun faktora prevencije, navodeći da kada veličina uticaja utiče na vjerovatnoću nastanka, odnosno kada ova dva pojma nisu nezavisna jedan od drugog, rizik se ne može jednostavno izraziti kao proizvod dva pojma, već se mora izraziti kao funkcionalni odnos.

Uticaji zavise od spremnosti da se brzo reaguje na krizu, odnosno od nivoa preventivne kulture (razvoj svijesti, strateških politika i kapaciteta) koju označavamo sa „P", što podrazumijeva razvoj preventivnih sistema ranog upozoravanja, pravovremene evakuacije, integraciju sistema zaštite itd. U analizi prirodnih opasnosti, uticaji se često izražavaju kao odnos između ranjivosti organizacije i izloženosti. Ranjivost "V" se definiše kao karakteristike i okolnosti zajednice, organizacije ili sistema koje ga čine podložnim negativnim efektima direktne ili indirektne prijetnje. Izloženost "E" je ukupnost ljudi, imovine, sistema ili drugih elemenata prisutnih u opasnim zonama koji su stoga podložni potencijalnim gubicima. Ovu zavisnost možemo izraziti na sljedeći način:
*Rizik = Ranjivost * Izloženost * 1/Prevencija*
Možemo zaključiti da je faktor prevencije "P" obrnuto proporcionalan proizvodu ranjivosti i izloženosti. Što je veći stepen rizika u matrici, to je manja vrednost preventivnog faktora i obrnuto. S obzirom na složenost faktora prevencije, uočavamo da je potrebno detaljnije determinisati komponente mjera koje utiču na određivanje kvalitativne i kvantitativne vrijednosti. Za određivanje preventivnog faktora „P" potrebno je sagledati stanje i mogućnost integrisanog upravljanja organizacijom. Ovakav pristup zahtijeva izradu pravno valjane projektno-planske dokumentacije koja uključuje procjene rizika i planove zaštite i spašavanja, primjenu tehničko-tehnoloških podsistema zaštite uključujući sisteme za otkrivanje i rano upozoravanje, kao i uspostavljanje obučenih i opremljenih stručnih službi za efikasan odgovor na krize.
Za određivanje preventivnog faktora "P" potrebno je detaljnije sagledati statuse i mogućnosti integracije nivoa upravljanja organizacijom pomoću zakonski definisane projektno-planske uređenosti, primijenjene tehničko-tehnološke zaštite, te uspostavljanja utreniranih i opremljenih stručnih službi za efikasan odgovor u slučaju krize (Garaplija, 2021).
Poučeni naučenim lekcijama iz prošlosti, možemo uočiti da je faktor prevencije "P" obrnuto proporcionalan vrijednosti rizika datoj kroz klasičnu matricu odnosa vjerovatnoće i uticaja rizika. Što je manji ukupni izračun preventivnog faktora, isti će direktno uticati da nivo rizika u matrici bude veći i obrnuto. Određivanjem skale za primijenjene mjere dobijamo numeričke relevantne kvantitativne i kvalitativne pokazatelje. Tako možemo zaključiti ako je faktor „P" na minimumu „1", on će onda kao obrnuto proporcionalan u formuli potvrditi nivo rizika pa ćemo dobiti da je UKUPNI RIZIK = 1/1*E*V. Suprotno tome ukoliko preventivni faktor bude ocijenjen sa 10, onda ćemo u izračunu dobiti umanjen UKUPNI RIZIK = 1/10*E*V
Analogijom uspješne primjene 3D Matrice rizika, koja nam pomoću preciznije determinisanog faktora prevencije daje unaprijeđeni izračun ukupnog rizika kojeg potvrđujemo egzaktnom empirijskom primjenom, usuđujemo se provocirati stručno-naučnu javnost uspostavljanjem 3D Modela logičke integracije metafizike i upravljanja rizicima u cilju jačanja svijesti o razumijevanju rizika od katastrofa kao prvog prioriteta za provedbu globalnog

okvira ujedinjenih nacija definisanog Sendai okvirom za smanjenje rizika od katastrofa 2015-2030.



Slika 3. 3D Model Logičke integracije metafizike i upravljanja rizicima od katastrofa

5. ZAKLJUČAK

Ovaj rad osvetljava potencijal metafizičkih uvida da informišu i unapređuju strategije upravljanja rizikom suočene sa klimatskim i androginim katastrofama. Premošćivanjem jaza između filozofije i praktične primjene, potičemo naučnu zajednicu da istražuje nove puteve za rješavanje složenosti našeg svijeta koji se stalno razvija u izazovima koje takav tehnološki razvoj donosi.

Kroz originalan naučni pristup za procjenjivanje rizika, uticaja i kapaciteta za efikasniji odgovor na klimatske i društveno-političke krize, ovim radom izazivamo stručno-naučnu zajednicu da usvoji proaktivno razmišljanje i nudi potencijalna rešenja zasnovana na uvidima stečenim iz korelacije između metafizičkog i naučnog diskursa.

Korelacije između metafizike i primijenjene matematike možda neće biti odmah očigledne, s obzirom na različitu prirodu ovih polja. Međutim, određeni filozofski principi mogu utjecati i ukrštati se s konceptima primijenjene matematike. Evo nekoliko ključnih tačaka koje treba uzeti u obzir:

Stručnjaci koji se bave upravljanjem rizicima od katastrofa, trebaju sagledati dostignuća metafizike kao temeljna baza filozofske misli o razumijevanju

postojanja i fundamenta prirode, kako bi analizom osnovnih metafizičkih koncepata unaprijedili rješavanje neizvjesnosti i efikasnije donosili informirane i pravovremene odluke u kriznim situacijama.
Logička integracija metafizike i upravljanja rizicima, bazirana na motodama primijenjene matematike i razvoja matematičkih modela koji se koriste za rješavanje praktičnih problema u nauci, treba da pruži egzaktnu podršku razvoju različitih reprezentativnih scenarija upravljanja u kriznim situacijama. Pri čemu sama primjena matematičke logike treba predstavljati spoj teorijskog znanja i praktične primjene.
Razvojem novih i unaprijeđenjem postojećih matematičkih modela, stručnjaci koji upravljaju rizicima a i sve druge zainteresirane strane, mogu identificirati, pratiti, analizirati i vrednovati različite meta-podatke i koristiti različite tehnike i scenarija za rješavanje različitih kriza.
Iako metafizika i primijenjena matematička logika za upravljanje rizicima mogu izgledati različite, postoje i značajna konceptualna ukrštanja, posebno u njihovim temeljnim pretpostavkama, tretmanu apstraktnih entiteta, razmatranjima uzročnosti i raspravama o prirodi znanja i logike. Ova ukrštanja naglašavaju i potencijal filozofskih logičkih principa da informišu i oblikuju pristupe unutar primijenjenih matematičkih matrica za upravljanje krizama.

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3D LOGICAL MODEL OF INTEGRATION BETWEEN METAPHYSICS AND DISASTER RISK MANAGEMENT

Original scientific paper

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Abstract

Science is built upon the continuous re-evaluation of evidence and empirical research driven by the desire for success and the fear of failure, while religion is based on the unconditional acceptance of original dogmatic traditions and fundamental principles of belief in God and eternal reward, coupled with the fear of divine punishment. Metaphysics, as the foundation of philosophical scientific thought, examines the nature of reality and existence, asking questions about what exists, why, in which time, space, and causality. Disaster risk management is an exact scientific discipline established on metaphysical examinations of causes and phenomena, along with mathematical models of prediction and consequence analysis. This paper explores the intriguing correlation between the logical relationships of metaphysical principles and disaster risk management. By delving into the philosophical realm of metaphysics, we analyze concepts such as uncertainty, causality, and the nature of reality. Drawing correlative connections, we examine the development of a logical matrix of cause and effect to better understand metaphysical principles that can timely alert decision-makers and improve their risk management strategies. Researching the interconnections of fundamental principles in the domains of risk, impact, and response capacity to crises offers a fresh perspective on addressing uncertainty and making informed decisions in complex situations. Conclusions will be defined using analytical-deductive and synthetic methods, comparing the relationship between metaphysics and applied science within the framework of the multi-millennial challenges faced by humanity, from the time of Noah's flood to contemporary crises and approaches to resolving them. The paper will

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scientifically determine risks, impacts, and capacities for more effective responses to climatic and socio-political crises, challenging the professional-scientific community to proactively offer answers to the question: Can the acceptance and understanding of the 3D logical model of integrated application of metaphysics and risk management contribute to reducing the vulnerability of humankind?

Keywords: Metaphysics, Logic, Risk Management, Integration

1. INTRODUCTION TO DEFINITIONS

Science relies on the continuous re-evaluation of evidence and empirical research driven by the desire for success and the fear of failure, while religion is based on the unconditional acceptance of original dogmatic traditions and fundamental principles of belief in God and eternal reward, coupled with the fear of divine punishment. In response to a journalist from Time magazine in 1923, one of the world's greatest scientists, Nikola Tesla, stated that "there is no conflict between the ideals of science and the ideals of religion, but science is opposed to theological dogmas because science is based on facts." However, isn't metaphysics as a branch of science based on the study of the nature of reality and existence also intertwined with dogmatic facts on which religious thought rests? In an era of increasing environmental concerns and a complex socio-political landscape, this paper aims to uncover the deep connections between metaphysical thought and scientific models of risk management related to climatic and anthropogenic disasters. By analyzing fundamental metaphysical concepts, our goal is to offer a unique perspective on resolving uncertainty and making informed decisions. Comparing metaphysics, disaster risk management, and applied mathematics involves considering their different areas of focus, methodologies, and applications.

1.1. Metaphysics

Metaphysics is a branch of philosophy that deals with understanding existence and the fundamental nature of things. It asks questions about what exists, the nature of objects, time, space, and causality. Metaphysics is more theoretical and abstract, dealing with questions that are often beyond physical measurement or scientific testing. As Agassi (1981) notes in his work, following the proposals of Descartes and Robert Boyle, "the traditional role of metaphysical principles was to generate rules for scientific investigations." One of the pioneers of logical thinking about the connection between metaphysics and mathematical models of exact science is the English mathematician, philosopher, and metaphysician Whitehead (1923), who asserts that Aristotle can rightfully be considered the most significant philosopher of metaphysics. Whitehead emphasizes that Aristotle found it necessary to complement his conceptual understanding of metaphysics by introducing the "First Mover – God." This fact is important in the history of metaphysics for two reasons. Firstly, there is no doubt that Aristotle was one of the most significant metaphysicians in history, considering his genius insight, the general wealth of his knowledge, and the influence of his metaphysical predecessors. Secondly, during the consideration of this metaphysical question, he was entirely devoid of passion, and his philosophical reflections have, in their rich reception, remained a primary source of various metaphysical explanations and foundations of reality. One of his students, Conger (1927), quotes his teacher in his notes, saying, "Every scientist, to preserve his reputation, must say that he does not like metaphysics. What he means is that he does not like his metaphysics being criticized." According to Whitehead, scientists and philosophers constantly make metaphysical assumptions about how the universe operates, but such assumptions are not easily discerned because they remain unexamined and unquestioned. While Whitehead acknowledges that "philosophers can never hope to definitively formulate these metaphysical principles," he also claims that people must constantly rethink their fundamental assumptions about how the universe functions if philosophy and science are to achieve real progress, even if that progress remains perpetually asymptotic. For this reason, Whitehead considered metaphysical research necessary for both good science and good philosophy. There are many examples of top scientists delving into the secrets of the connection between science and metaphysics, among whom Nikola Tesla should be particularly highlighted. He completely devoted himself to an ascetic life and the belief in the existence of a higher reality, studying phenomena, relations, energy, and vibrations in the universe.

1.2. Disaster risk management

According to the United Nations Office for Disaster Risk Reduction (UN DRR), disaster risk management is the application of policies and strategies to reduce disaster risk in order to prevent new disaster risks, reduce existing disaster risks, and manage residual risk, contributing to strengthening resilience and reducing disaster losses. Disaster risk management is an inevitable and integral part of the overall scientific discourse that deals with identifying and mitigating risks associated with natural and human-induced disasters. It includes planning, organizing, and implementing measures for disaster prevention, response, and recovery. This field is very practical and involves many on-the-ground activities, risk factor analysis, and strategy implementation to minimize damage.

Since 2015, the European Commission has initiated activities of the "Knowledge Centre for Disaster Risk Management" (DRMKC), which prepared reports in the leading series "Science for Disaster Risk Management." Two reports were published, the first in May 2017 and the second at the end of 2020, subtitled "Knowing Better and Losing Less." Both reports built on their successful outcomes and learned from their multisectoral and multidisciplinary networking process (which involved over 270 collaborators). The Science for DRM 2020 report took a step further in strengthening the interface between science and society, focusing its analysis on the impacts of disasters on various sectors of human life and activities. The DRMKC supports the strengthening of cooperation between scientists, policymakers, practitioners, and citizens, further enhancing the use of good knowledge for more effective communication and disaster risk management. The Science for DRM 2020 report: acting today, protecting tomorrow seeks concrete innovative solutions – moving from identifying needs to identifying solutions. Based on the European scope of the DRMKC, the topics covered in the Report are primarily addressed to the European audience but are universal and follow the United Nations Platform for Disaster Risk Reduction (UN DRR). Similarly, the document would consider all stages of the disaster risk management cycle and the impacts of disasters, emphasizing the added value of shared knowledge acquisition, including all relevant disciplines, sectors, and stakeholders, and recognizing that disaster risk actions are implemented in various ways at different governance levels: local, subnational, national, and ultimately European.

1.3. Logics

The Greek philosopher Aristotle from the 4th century BC was the first to use variables to represent logical expressions. During the Middle Ages, Aristotle's deductive logic was further developed until the 17th century when the English philosopher Francis Bacon introduced inductive logic, presenting it as an "instrument of scientific research," as noted by Joseph D. (1902). In the 19th and 20th centuries, mathematical logic based on the work of Gottfried Wilhelm Leibniz, a German philosopher and mathematician, developed. Leibniz studied the works of Galileo, Francis Bacon, Thomas Hobbes, and René Descartes, attempting to reconcile these modern thinkers with Aristotle's metaphysical scholasticism.[1] Engaging with metaphysics and logic, Leibniz distinguished himself by independently discovering differential and integral calculus. Prominent representatives of his school included Rudolf Carnap, Bertrand Russell, and Alfred Tarski. Their logical reflections utilized a special system of symbols (similar to mathematical ones) with strictly defined meanings. This system of symbols was somewhat limited in its application to complex phenomena of expressed dynamics, such as natural and social phenomena. Following the emergence of mathematical logic, symbolic logic developed, initially being only a more advanced form of deductive logic but later encompassing inductive logic. This logic is broader and more exact than traditional logic.

Today, logical matrices represent one of the supporting pillars of applied mathematics and the development of mathematical methods and models used to solve practical problems in science, engineering, business, and other fields. Applied mathematics itself represents a combination of theoretical knowledge and practical application. Applied mathematicians develop mathematical models, analyze data, and use statistical techniques to solve real-world problems.

Each of these disciplines uses different methodologies and serves different purposes. Metaphysics heavily relies on logical reasoning and philosophical discussion. Disaster risk management, on the other hand, employs a combination of practical planning, policy-making, and management strategies. Applied mathematics emphasizes mathematical

[1] *Gottfried Wilhelm Leibniz, born in Leipzig1646, died 1716 in Hanover, Germany. https://www.britannica.com/biography/Gottfried-Wilhelm-Leibniz*

modeling, statistical analysis, and the application of mathematical theories to solve specific problems.

Although these scientific disciplines differ in their approaches and areas of focus, there is undoubtedly frequent overlap, especially between applied mathematics and disaster risk management. For example, mathematical models are crucial in predicting disaster scenarios and formulating effective management strategies. Metaphysics, although less visibly directly connected, offers deep insights into understanding concepts such as risk, causality, and the nature of human decision-making, which directly and indirectly affect disaster risk management and applied mathematics.

2. SCIENTIFIC PRINCIPLES AND METHODOLOGICAL FRAMEWORK

2.1. Scientific principles

Starting from the principle that methodology is a scientific discipline that studies the paths of scientific cognition (Žugaj, Dumičić, and Dušak 2006), we can say that it is the path that science should follow (Čendo-Metzinger and Toth 2020). To properly understand the correlations of the methodological frameworks of defined scientific disciplines, we must first define the concept of science and its basic principles. Čendo-Metzinger and Toth (2020) further state that science is a systematized and argued body of knowledge about objective reality in a given historical period, achieved through the application of objective scientific methods. In this sense, we can say that science has five main goals: describing the phenomena it deals with, classification, explanation, prediction, and control (Vukosav and Zarevski 2011). Authors Žugaj, Dumičić, and Dušak (2006) systematize the basic characteristics of science: the social character of science, the unity of theory and practice, creativity in science, the international nature of science, and scientific research and the application of scientific methods. The social character of science refers to its universality and its aspiration to serve the interests and progress of all humanity. The unity of theory and practice in science implies the constant intertwining of theory and practice, i.e., practice relying on science and science being validated through practice. Creativity in science refers to the creativity and innovativeness of scientists. Scientific research and the application of scientific methods involve a systematic search for knowledge and understanding of phenomena and facts in the environment using scientific methods. The international nature of science signifies that science cannot be confined to narrow national frameworks but is universally human in its nature and social role. In addition to the basic characteristics of science, scientific activity is characterized by objectivity, reliability, precision, the analytical-synthetic procedure, systematization, and rationality (Žugaj et al. 2006).

2.2. Metohodology

The methodology of this paper included analytical-synthetic, inductive-deductive, and statistical methods, as well as methods of description and comparison. Analytical-synthetic methods were used to first break down complex elements of metaphysical phenomena and concepts of disaster risk management into simpler parts, which were then connected into more complex thought constructs or an integrated logical whole. The inductive method was used to draw general conclusions about the correlations between metaphysics and disaster risk management from known individual historical examples of recorded disasters. The induction method allowed us to discover new facts and regularities based on individual cases and knowledge. Deduction was used to derive individual insights from general positions and principles. By observing the overall picture of phenomena, we first arrive at a common-sense logical judgment that everything in nature and around us happens with precise determination defined by probability and a certain impact on people and the environment. A particular insight is the realization that readiness for disasters should be considered in the precise determination of an algorithm for calculating the risk matrix. By using analytical-synthetic and inductive-deductive methods, we draw conclusions that synthesize insights from metaphysics and risk management. This integrative approach aims to provide a holistic understanding of effective strategies for mitigating vulnerability in the context of climatic and socio-political crises. Engaging first in rigorous research of metaphysical principles, we dissect their implications for understanding uncertainty, causality, and the nature of reality. By applying statistical methods based on the characteristics of certain groups (samples) collected through scientific research, historical or dogmatic teachings, we conclude about the regularities and patterns of different types of sets (population, material, environmental, etc.). Describing metaphysical phenomena and different conceptual understandings of disasters, we pose theses for discussion about their mutual connections and relationships, which can be with or without scientific explanation and interpretation. Using the comparative method, we initiate a process of comparing the same or similar metaphysical phenomena taught by dogmatic norms and common-sense principles based on historical facts, after which we approach determining the matrix of their similarities and differences. Exploring the parallels between metaphysical principles, logical matrices, and risk management strategies aims to uncover patterns that can contribute to a more nuanced and effective approach to mitigating the impacts of climatic and anthropogenic disasters on people, the economy, and the environment. Considering the individual metaphysical methodological framework, we lay the foundation for subsequent examination of the applicability of the logical model for more effective disaster risk management. The integrated methodological framework we study defines an innovative three-dimensional perspective of interconnected correlative levels that enable integrated disaster risk management. The first level in developing the integrated methodology involves the metaphysical understanding of natural and anthropogenic phenomena and the causes of crises. The second level is based on developing a logical matrix for identifying, analyzing, and evaluating risks. The third level involves building policies for strengthening the capacity for prevention, preparedness, and response to reduce disaster risk. Studying the innovative three-dimensional model of mutual correlations represents an advanced approach to seeking life answers on the scale of success between spirituality and science. This correlation, in its phase of understanding, experiences a logical catharsis, as everything with spiritual determination has its materialization, which in scientific terms implies a balance of calculations in an equation with one or more unknowns.

3. FUNDAMNTAL PRINCIPLES AND HISTORICAL CONTEXT

3.1. Fundamental principles

Exploring the interconnectedness of fundamental principles and the historical context of metaphysics with risk management, we aim to establish a logical matrix of understanding the philosophy of religious thought that can improve our ability to understand phenomena, predict events, and resolve uncertainty, making informed decisions in complex and crisis situations such as sudden natural and other disasters.

F.W. Waters in his book "The Way In and the Way Out" (1967) and Alastair McKinnon in "Falsification and Belief" (1970) suggest similarities between science and religion: both involve flawed and limited attempts to apply fundamental principles. But these principles themselves are not uncertain. Therefore, McKinnon argues, a scientist committed to the principle that the world has order and a believer committed to faith in God must try to show that experience and life become comprehensible through the rational application of the respective principle. Donald Vibe's "Religion and Truth" (1981) is a plea to take religious knowledge seriously – even to create an appropriate science from that knowledge. He acknowledges that religious truth is very complex but believes that truth and falsehood should be the central concern of scholars in this field. He strongly condemns the tendency of scholars in religion to describe beliefs without evaluating them (Armour L. et al. 2012).

Rubinoff (1970) argued in favor of British philosopher R.G. Collingwood that our scientific and other views of the world must be seen in the context of the assumptions with which people approach. Metaphysical systems and religious worldviews can be considered understandable if taken as representations of how the human mind is capable of seeing the world at different times. Throughout history, these changing views begin to reveal a pattern that Rubinof called "the transcendent structure of reality," a structure that appears through but ultimately leads beyond the immediacy of human experience.

Armour L. et al. (2012) note that there has been significant interest in the nature of religious practice and religious experience, where philosophy is used as a tool for understanding but does not challenge religious belief.

3.2. Historical context

Considering the multi-millennial challenges that humanity has faced, we analyze and compare historical examples such as Noah's flood with contemporary disasters that have affected humanity in recent centuries. This historical perspective helps in identifying response patterns and the evolution of social approaches to catastrophic events. From the perspective of religious teachings, all God's prophets were endowed with the best human attributes and honored with God's gift of predicting situations and informing their peoples, preparing them for upcoming crises and disasters. In the Islamic holy book revealed to the Prophet Muhammad, it states: "We sent Noah to his people, and he remained among them for a thousand less fifty years; then the flood overtook them because they were wrongdoers" (Quran 29:14). In the Bible, in Genesis 6:9, this event is described as follows: "The Lord then said to Noah, 'Enter the ark, you and your whole family, because I have found you righteous in this generation. Take with you seven pairs of every kind of clean animal, a male and its mate, and one pair of every kind of unclean animal, a male and its mate, and also seven pairs of every kind of bird, male and female, to keep their various kinds alive throughout the earth. Seven days from now, I will send rain on the earth for forty days and forty nights, and I will wipe from the face of the earth every living creature I have made.'"

In ancient Greece, they also contemplated disasters, as Sandin P. (2002) notes that despite the surprising scarcity of academic philosophical discussions on this topic, disaster – or the potential for disaster – was present in Western philosophy from its early days. For example, in Timaeus and Critias, Plato recounts the myth of Atlantis, where disaster befell a once powerful kingdom: "But later there occurred violent earthquakes and floods, and in a single day and night of misfortune, all your warlike men in a body sank into the earth, and the island of Atlantis in like manner disappeared in the depths of the sea" (Plato 1925, 25c-25d).

Similar eschatological myths have prevailed for millennia in Christianity as well as in other religious traditions. A key point in this development, which perhaps marks the beginnings of modern philosophical engagement with disasters, is the Lisbon earthquake of 1755. It occurred in the morning on November 1, when many residents of the city were attending mass. The center of the city, where the nobility lived, was particularly affected (Dynes 2000).

In a recent work, Paul Voice (2016) offers a relevant categorization of areas where philosophers could engage with disasters. First, there is a set of metaphysical and, in some cases, theological questions. This is what concerned philosophers in seeking answers to the question, "What is a disaster?" Second, there is an ethical approach that primarily deals with individuals and their actions. This includes applied ethical issues such as the responsibilities of healthcare workers in disaster situations, triage questions in wartime, and so on. Third, there is a political-philosophical perspective that primarily deals with institutions rather than individuals, with questions such as what coercive measures the state justifies taking in a post-disaster situation.

4. 3D LOGICAL MODEL OF RISK MANAGEMENT

Before engaging in a synthetic analysis, Garaplija (2018) notes that the conventional two-dimensional perception of the Risk Matrix boils down to determining the probability and impact that define a certain risk in one of its forms, such as natural disasters (earthquakes, floods, fires, pandemics, etc.) or accidents caused by human intent (wars, terrorism, sabotage) or human negligence. This definition of the Risk Matrix is identical to the calculation of the risk matrix given in the ISO 31000 risk management standard.

Risk = Hazard Impact * Probability

However, the development of various risk management models in real crisis situations caused by natural and other disasters in the last decade has shown the inadequacy of the conventional risk management approach, where a more precise calculation of the preventive factor "P" is needed. Many organizations in developing countries have begun to prioritize risk management. Therefore, scientists have explored a new model that includes organizational maturity as a new dimension in project risk assessment. In their research methodology, they used a hybrid system based on fuzzy rules (BWM-FRBS) combined with a 3D matrix for assessing risk probability and mathematical equations generated for organizational impact and maturity.

Hayder R. A. and Hatim A. (2023) state that considering the possibilities of improving project construction and operation in Iraq, investors and contractors saw the need for a new, more efficient approach to risk management during the reconstruction of critical infrastructure. After analyzing several research studies, experts formed the initial structure of risk assessment and confirmed the final components of model parameters. The component weights were calculated using the BWM technique. Equations for impact and organizational maturity were prepared. The outputs of previous equations and the probability of occurrence were then used as inputs for the FRBS model to determine the risk score. This model used a 3D risk matrix to construct fuzzy rules, as shown in Figure 1 below. Iraqi construction projects were used as a case study to validate the integrated model. The transition to the 3D hybrid model proved to be more efficient and precise than earlier 2D conventional techniques for risk assessment and prioritization and can provide critical information for risk management.

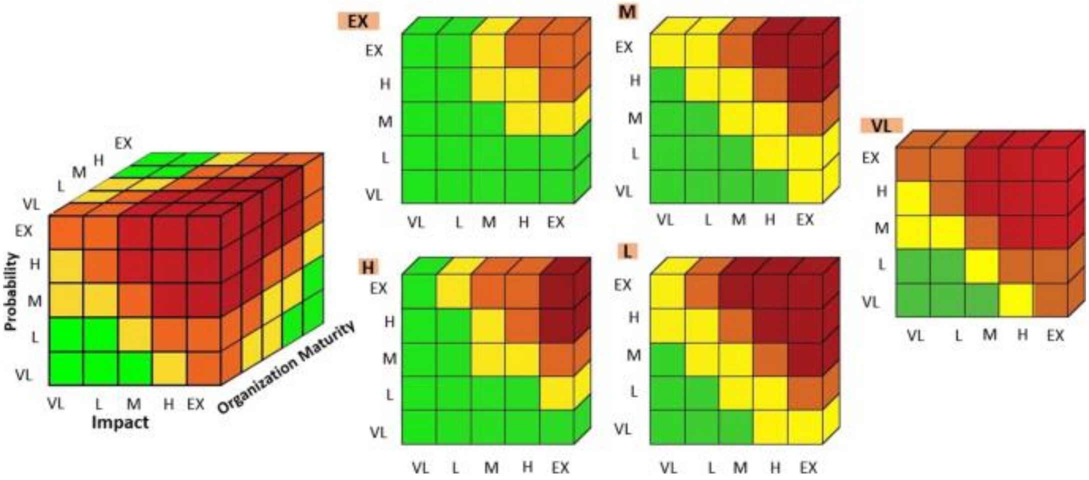

Fig. 1. BWM – FRBS model of the risk score matrix

Further breaking down the advanced 3D Risk Matrix, Garaplija (2023) instead of the general concept of organizational maturity, introduces a more precise calculation of the preventive factor, stating that when the impact size affects the probability of occurrence, i.e., when these two concepts are not independent of each other, the risk cannot simply be expressed as the product of two concepts but must be expressed as a functional relationship. Impacts depend on the readiness to quickly respond to a crisis, i.e., the level of preventive culture (development of awareness, strategic policies, and capacities), which we denote as "P," implying the development of preventive systems, early warning systems, timely evacuation, integration of protection systems, etc. In the analysis of natural hazards, impacts are often expressed as the relationship between organizational vulnerability and exposure. Vulnerability "V" is defined as the characteristics and circumstances of a community, organization, or system that make it susceptible to the adverse effects of a direct or indirect threat. Exposure "E" is the totality of people, property, systems, or other elements present in hazardous areas that are therefore subject to potential losses. This dependence can be expressed as follows:

Risk = Vulnerability * Exposure * 1/Prevention

We can conclude that the preventive factor "P" is inversely proportional to the product of vulnerability and exposure. The higher the level of risk in the matrix, the lower the value of the preventive factor and vice versa.

Considering the complexity of the preventive factor, it is necessary to more precisely determine the components of measures that affect the qualitative and quantitative value determination. To determine the preventive factor "P," it is necessary to consider the state and possibility of integrated organizational management. This approach requires the preparation of legally valid project planning documentation, including risk assessments and protection and rescue plans, the application of technical and technological protection subsystems, including detection and early warning systems, and the establishment of trained and equipped professional services for efficient crisis response. To determine the preventive factor "P," it is necessary to more precisely consider the statuses and possibilities of integrating organizational management levels through legally defined project planning regulations, applied technical and technological protection, and the establishment of trained and equipped professional services for efficient crisis response (Garaplija 2021). Learning from past lessons, we can see that the preventive factor "P" is inversely proportional to the risk value given through the classical matrix of probability and impact relationships. The lower the total calculation of the preventive factor, the higher the risk level in the matrix and vice versa. Determining the scale for applied measures provides numerical relevant quantitative and qualitative indicators. Thus, we can conclude that if the preventive factor "P" is at a minimum "1," it will, as inversely proportional in the formula, confirm the risk level, resulting in TOTAL RISK = 1/1EV. Conversely, if the preventive factor is rated "10," we will get a reduced TOTAL RISK = 1/10EV in the calculation. Analogous to the successful application of the 3D Risk Matrix, which, through a more precisely determined preventive factor, gives an improved calculation of total risk confirmed by exact empirical application, we dare to provoke the professional-scientific community by establishing the 3D Model of Logical Integration of Metaphysics and Risk Management to raise awareness about understanding disaster risks as the first priority for implementing the United Nations global framework defined by the Sendai Framework for Disaster Risk Reduction 2015-2030.

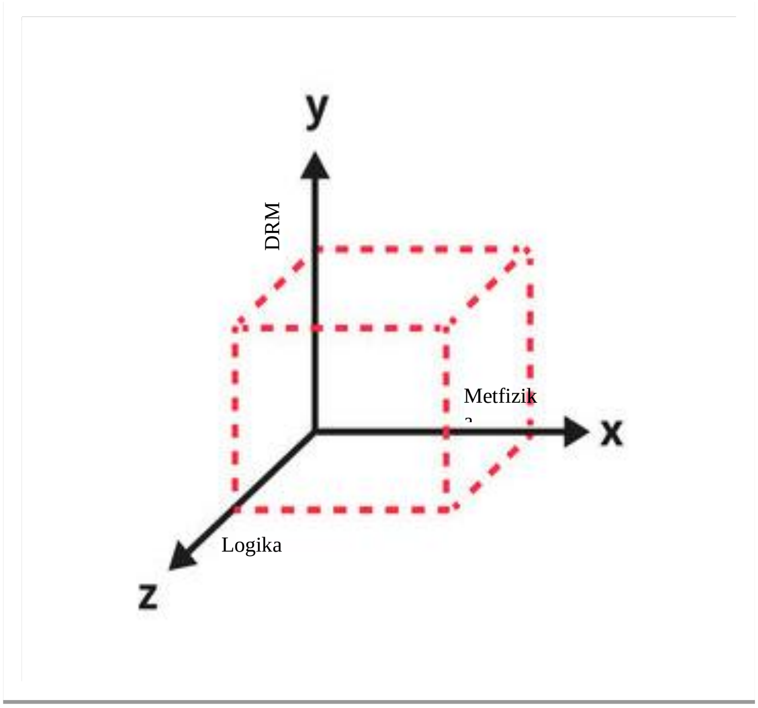

Fig. 3. 3D Model of Logical Integration of Metaphysics and Disaster Risk Management

5. CONCLUSION

This paper illuminates the potential of metaphysical insights to inform and improve risk management strategies in the face of climatic and anthropogenic disasters. By bridging the gap between philosophy and practical application, we encourage the scientific community to explore new paths for addressing the complexities of our evolving world and the challenges brought by such technological development.

Through an original scientific approach to assessing risks, impacts, and capacities for more effective responses to climatic and socio-political crises, this paper challenges the professional-scientific community to adopt proactive thinking and offer potential solutions based on insights gained from the correlation between metaphysical and scientific discourse.

The correlations between metaphysics and applied mathematics may not be immediately obvious, given the different nature of these fields. However, certain philosophical principles can influence and intersect with the concepts of applied mathematics. Here are some key points to consider:

Experts dealing with disaster risk management should view the achievements of metaphysics as the fundamental basis of philosophical thought on understanding existence and the nature of fundamental principles to improve uncertainty resolution and make more informed and timely decisions in crisis situations by analyzing basic metaphysical concepts.

The logical integration of metaphysics and risk management, based on applied mathematics methods and the development of mathematical models used to solve practical problems in science, should provide exact support for developing various representative management scenarios in crisis situations. The application of mathematical logic itself should represent a combination of theoretical knowledge and practical application.

By developing new and improving existing mathematical models, risk management experts and all other interested parties can identify, track, analyze, and evaluate various meta-data and use different techniques and scenarios for resolving various crises.

Although metaphysics and applied mathematical logic for risk management may seem different, there are significant conceptual intersections, particularly in their fundamental assumptions, treatment of abstract entities, considerations of causality, and discussions on the nature of knowledge and logic. These intersections highlight the potential of philosophical logical principles to inform and shape approaches within applied mathematical matrices for crisis management.

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