



2005

V o l u m e 5

**Prof Dr Timi Ecimovic and Prof Emeritus DDr Matjaz
Mulej**

Multilingual digital book

A n t h o l o g y 2 - 2001 - 2014

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89 PAGES

2014



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1.

Here we present only Bosnian language writings from the bilingual booklet “Agenda 21 for the Municipality of Bosanska Krupa, B&H”. The booklet is displayed at www.institut-climatechange.si

Općina Bosanska Krupa

Agenda 21

PROGRAM ZA TRAJNO ODRŽIVU BUDUĆNOST

(Sukladno sa Skupom o Zemlji, Rio, 1992 i Skupom za trajno održivi razvoj Johannesburg, 2002 i prezentira mogućnosti, da se sutra može živjeti u Bosanskoj Krupi)

Bosanska Krupa

2005



Agenda 21

Za trajno održivu budućnost područja općine Bosanska Krupa

**Bosanska Krupa, maj
2005**

Zahvala

Anthology 2 – 2001 - 2014



Zajedno sa suradnicima zahvaljujemo se svima koji su omogućili izradu ove Agende 21 za trajno održivu budućnost područja općine Bosanska Krupa.

Posebno se zahvaljujemo jer je Agenda 21 prvi korak u smjeru ka boljoj budućnosti stanovništva, jer je stanovništvo područja općine Bosanska Krupa možda među onima u Bosni i Hercegovini, koji su najviše stradali i napatili se za vrijeme besmislenog rata, mislimo da oni i zaslužuju svu pažnju kako unutrašnjih - općine, Unsko – Sanskog kantona i vlade Federacije, tako i vanjskih Evropske Zajednice i pojedinih članica iste, ostalih zemalja Evrope, Ujedinjenih Naroda kao i drugih zemalja svijeta, koje humanitarno surađuju.

Zahvaljujemo se na suradnji svima, koji su surađivali do danas, a nadamo se na suradnji onih, koji će nam pomoći, na provedbi ove Agende 21 za trajnu održivost područja općine Bosanska Krupa.

Prof. Dr. Timi Ećimović

Predgovor



Agenda 21 za trajno održivu budućnost područja općine Bosanska Krupa je program koji je nastao u suradnji prof. dr. Timi Ećimovića, načelnika općine gospodina Hamdija Grošića, prijašnjeg načelnika općine gospodin Džemaludin Čauševića, članova općinske uprave, škola, nevladinih organizacija, stručnjaka i građana Bosanske Krupe, kao ekipi volontera sa zajedničkom željom, da Bosanska Krupa ima bolje sutra.

Paralelno sa Agendom 21 moramo se zahvaliti da postoje i potrebno je aktivno koristiti postojeće programe: Strateški plan razvoja općine Bosanska Krupa, Program razvoja turizma i rekreacije i druge.

Autor Agende 21 za područje općine Bosanska Krupa je prof. dr. Timi Ećimović uz volontersku suradnju sljedećih ljudi dobre volje:

- | | |
|-------------------------|--------------------------------|
| 1. Ademir Mesić | prof.informatike |
| 2. Alija Topčagić | dr.vet.med. |
| 3. Alija Patković | ing.zaštite na radu |
| 4. Asima Mušić | dipl.ing.arhitekture |
| 5. Asima Skenderović | dipl.ing.agronomije |
| 6. Dajra Zjakić | nastavnik književnosti |
| 7. Dedo Bešić | privatni poduzetnik |
| 8. Dubravka Porić | dipl.ing.šumarstva |
| 9. Đemaludin Čaušević | prof.ind.predagogije |
| 10. Edhem Dizdarević | upravni pravnik |
| 11. Enes Mustedanagić | dr.vet.med. |
| 12. Hakija Zolić | ing.elektrotehnike |
| 13. Hamdija Grošić | ing.elektrotehnike |
| 14. Hasan Oraščanin | prof. sociologije |
| 15. Hikmet Harbas | Eko Riba Krusnica |
| 16. Idriz Ezić | dipl.ecc |
| 17. Ibrega Badnjević | prof. istorije |
| 18. Ibrahim Skenderović | dipl.politolog |
| 19. Igor Umičević | predsjednik omladinskog vijeća |
| 20. Ismet Sendić | dipl.ing.šumarstva |
| 21. Ilijaz Osmanagić | vss. |
| 22. Izolda Osmanagić | prof. |
| 23. Jusuf Dupanović | dipl.ing.agronomije |
| 24. Mumin Veladžić | dipl.ing.agronomije |
| 25. Mustafa Ramić | dr.pedijatar |
| 26. Nijaz Tatarević | ecc |
| 27. Refik Halkić | privatni poduzetnik |
| 28. Samir Porić | dr.por.med. |
| 29. Sanda Redžić | ecc |
| 30. Salih Suljanović | nastavnik muzike. |
| 31. Senada Avdagić | dipl.žurnalist |
| 32. Suad Mesić | dr.prim |
| 33. Teufik Sedić | dip.ing.mašinstva |

i još mnogih koji nisu ovdje navedeni.

Volonterski tajnik Agende 21 za održivu budućnost područja općine Bosanska Krupa je: gospodin Fikret Harbaš iz općine Bosanska Krupa.



Tehnički tim za pripremu i obradu materijal Agende 21 je: gospođa Esma Hergić, gospodin Ademir Mesić i gospodin Fikret Harbaš.

Koordinator Agende 21 za trajnu održivu budućnost područja općine Bosanska Krupa je: Gospodin Hamdija Grošić, načelnik općine.

**PRINCIP AGENDE 21 ZA TRAJNO ODRŽIVU
BUDUĆNOST PODRUČJA OPĆINE BOSANSKA
KRUPA JE U DEMOKRATSKOM PRISTUPU I
UČEŠĆU ŠTO VEĆEG BROJA STANOVNIKA OPĆINE.
BILO KO, KO MISLI, DA IMA NEŠTO ZA DODATI,
PROMIJENITI ILI PREDLOŽITI PO SADRŽAJU OVE
AGENDE 21 ZA TRAJNO ODRŽIVU BUDUĆNOST
PODRUČJA OPĆINE BOSANSKA KRUPA JE
DOBRODOŠAO DA TO UČINI. KOORDINATOR
AGENDE 21 JE NAČELNIK OPĆINE BOSANSKA
KRUPA GOSPODIN HAMDİJA GROŠIĆ I MOLIMO
VAS, DA MU PISMENO PREDLOŽITE VAŠA
ZAPAŽANJA.**

**Koordinator Agende 21 za trajno održivu budućnost područja općine
Bosanska Krupa:**

Hamdija Grošić, načelnik

Općina Bosanska Krupa

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Uvod



Agenda 21 je program aktivnosti stanovnika na određenom području, koji žele, da se sutra živi sukladno sa stvarnim mogućnostima prirode, prostora i okoliša, kao i političke, ekonomske i socijalne stvarnosti. Kao takva Agenda 21 za područje općine Bosanska Krupa nastaje na ruševinama iz rata i poslije deset godina a sa namjerom, da omogući stanovnicima trajno održivu budućnost u trećem tisućljeću naše dobi.

Na Skupu o Zemlji u Rio de Janeiru, juna 1992 godine postavljeni su temelji za trajno održivu budućnost prihvatanjem «Agende za promjenu», koja postavlja sadržaj programa usmjeravanja Zemlje, nekih područja (kontinenti, države, pokrajine, općine, privredni subjekti itd.) u smislu trajno održive budućnosti. Deset godina kasnije u Johannesburgu u Južno Afričkoj Republici, augusta/septembra je ponovno potvrđena Agenda 21 i ostali sadržaji potrebni za usmjeravanje života u novo nastalim vremenima velikih promjena na Zemlji – sistem klimatskih promjena i političko-ekonomsko-socijalni sistem naše civilizacije (globalizacija, internacionalizacija, slobodna trgovina, transport, energija itd.). Na taj način Ujedinjeni narodi postavili su platformu, koju mogu stanovnici koristiti sa namjerom, da svoje područje, njegovu prirodu i političku, ekonomsku kao i socijalnu stvarnost prilagode uvjetima života.

Općina Bosanska Krupa doživjela je kataklizmu uništavanja u zadnjem ratu. Svi sadržaji života stanovništva su bili uništeni. Dolaskom mira stanovništvo se je našlo u situaciji, da treba uspostaviti sve osnovne i ostale sadržaje potrebne za život, od krova nad glavom, hrane i vode, odjeće i obuće, medicinske pomoći i svih ostalih sadržaja civilizacije, i to sve na zgarištu. Tako je primarna obnova omogućila život ali to samo na osnovnom nivou. Danas, toliko godina poslije rata. stanovništvo općine Bosanska Krupa nalazi se u situaciji, da se bori za bolje sadržaje ali sa malim mogućnostima. Sadržaji života su zaostali za životom i za bolje sutra potrebno je urediti osnovne sadržaje i njihovu nadgradnju. To je izazov sadašnjega stanovništva Bosanske Krupe i to su sadržaji projekata, koji bi omogućili bolje sutra.

Izradom Agende 21 za područje općine Bosanska Krupa namjera nam je bila, da osvijetlimo probleme sadašnjice i sutrašnjice, da zacrtamo osnove života sutra, da postavimo sadržaje potrebnih projekata u uvjetima sadašnjice i velikih promjena na Zemlji.

Sistem klimatskih promjena kao i zaštita prirode, prostora i okoliša su sadržaji, koji traže nova rješenja. Bolji uvjeti života stanovništva biti će osnova i predstavljati će razliku od ostalih područja, koja će rezultirati u opstanku stanovništva na području i tako omogućiti politički, socijalni i ekonomski život i mogućnosti odgoja djece, kao jedinog bogatstva koje imamo.

Poseban sadržaj Agende 21 proizlazi iz prirode područja općine Bosanska Krupa, rijeka Una je osnova i ona je po riječima Dr. Nijaza Abadžića jedna, jedina i jedinstvena. Tako se danas nalažu obaveze, koje su usko povezane sa tim sadržajem. Moguće je kraće se izraziti, tako da su uvjeti života po sadržaju vezani sa kvalitetom prirode i obratno. Sutra će biti dobro, samo ako je ta sprega života i prirode uravnotežena tako, da je život moguć. Taj uvjet zahtijeva velike napore već u fazi planiranja a isto tako i provedbe sadržaja.

Financijski zalogaj je svakako prevelik za mogućnosti općine Bosanska Krupa kao i kantona pa i Federacije. Mislimo, da je moguća provedba samo uz pomoć i suradnju međunarodnih institucija od Evropske zajednice, Ujedinjenih naroda i drugih. U tom smislu mislimo, da imamo sadržaje, koji su sukladni sa zahtjevima i mogućnostima.

Na racionalan način mislimo prezentirati sadržaje života, koji mogu omogućiti život u Bosanskoj Krupi sutra pa i kasnije. Izlazak predstavlja ocjena stanja. Na toj osnovi se planiraju sadržaji života, koje je potrebno urediti. Osnovna misao je u jedinoj vrijednosti – čovjeku. Taj dio bogatstva područja općine Bosanska Krupa je najviše izgubio, i na povratku ili rasti stanovništva se osniva ova Agenda 21. Cilj



Agende 21 je, da se obnove osnove života stanovništva i zaštita prirode i tako zaustavi odlazak stanovništva. Čak i bolje, da se na osnovi uvjeta života omogućí povratak i dolazak novog stanovništva.

Postavljajući osnovnu vrijednost na stranu stanovništva i uvjeta života unutar područja općine Bosanska Krupa postavlja se novi temeljac obnovi. Sada neprihvatljivi uvjeti – niska kvaliteta standarda stanova i kuća, putova, kanalizacije, komunikacija, škola, korištenja energije i posljedica rata može se nadomjestiti sa sadržajima promijene na pozitivnu stranu. Potrebno je identificirati projekte i njihov utjecaj na postavljeni cilj i na taj način pomoći promijeni na bolje uvjeta života. Takvim pristupom imali bi bolje osnovne uvijete od mnogih drugih mjesta u Bosni i Hercegovini.

Sadašnji problem smanjenog broja stanovnika i odlaska stanovništva u područja sa boljim uvjetima života bi na taj način zaustavili i omogućili pozitivne trendove. Isto tako sa pozitivnim radovima na obnovi i uključivanjem stanovništva u pripremne i provedbene radove bi dobili dizanje svijesti stanovništva i bolje rezultate rada.

Danas i u buduću najveći problem Zemlje pa i područja općine Bosanska Krupa su djelovanje promjena sistema klimatskih promjena. Izradom Agendom 21 za trajno održivu budućnost područja općine Bosanska Krupa želimo zacrtati i izraditi, mogućnosti i načine za smanjivanje utjecaja i djelovanja sistema klimatskih promjena na prirodu, prostor i okoliš. Isto tako važno je pripremiti sadržaje, koji će biti u uvjetima djelovanja sistema klimatskih promjena najviše zahvaćeni i to: nivo tekućih i ostalih voda, promijene sastava biljnog i životinjskog svijeta, češće poplave i sušni periodi, pojava kratkotrajnih ali mnogo jačih vjetrova, promjena lokalne klime po temperaturama, koje će rasti, po padavinama, koje će u kraće vrijeme imati veće količine vode, povećavanje ili smanjivanje plodnosti poljoprivrednih površina, promijene sadržaja šuma, erozija poljoprivrednih i drugih površina itd.

Agenda 21 za trajno održivu budućnost područje općine Bosanska Krupa je dokument, koji se ne postavlja sa nepogrešivošću, nego mislimo, da je otvoren dokument, koji se sa vremenom dopunjava i tako prilagođava novim uvjetima.

Prihvatanjem Agende 21 za područje Bosanske Krupe, općina dobija novu kvalitetu rada. Rješavanje uvjeta života je osnovni sadržaj svake lokalne uprave, ali iz mnogo uzroka, i u mnogim lokalnim upravama širom svijeta se sve manje i manje rješavaju baš ti problemi. Tako se sa provedbom Agende 21 povezuju sadržaji, koji su od najvećeg značaja za povećavanje mogućnosti života stanovništva općine Bosanska Krupa, da imaju bolju sutrašnjicu.

Mislimo, da je od najvećeg značaja, da ova Agenda 21 postane sadržaj života svih nas i tako postane motiv svake familije i stanovnika naše općine. U tom smislu mislimo, da bi svaki stanovnik općine Bosanska Krupa dobio svoju kopiju Agende i na njoj surađivao.

Sadržaj



1. Općina Bosanska Krupa – stanje
2. Komunalna (Komunalna infrastruktura)
 - 2.1. kanalizacija
 - 2.2. komunikacije
 - 2.3. otpad
 - 2.4. ceste
 - 2.5. snabdijevanje električnom energijom
 - 2.6. gradski transport
 - 2.7. grijanje
 - 2.8. gradska čistoća, uređenost i održavanje zelenih površina
 - 2.9. protiv požarna zaštita
3. Mjesta i naselja
4. Rijeke Una i Krušnica
5. Šume
6. Energetika
7. Poljoprivreda
8. Školstvo
9. Kultura
10. Zdravstvo
11. Transport
12. Privreda
13. Turizam
14. Sport i rekreacija
15. Zaštita prirode, prostora i okoliša

1. Općina Bosanska Krupa - stanje



Područje općine Bosanska Krupa se teritorijalno nalazi na području dolina rijeke Une i Krušnica. Najveći dio grada Bosanske Krupe nastao je na niskom previju između Huma i Starog grada na nadmorskoj visini od 176 metara i u proširenom dijelu rijeke Une. Otoka drugo središte unutar općine je nastalo nešto sjevernije od Bosanske Krupe na rijeci Uni.

Općina Bosanska Krupa je prije rata zauzimala prostor od 778 km². U toku rata došlo je do odcjepljenja općina Bužim i Krupe na Uni, tako da općina Bosanska Krupa danas zauzima prostor od 556 km².

Općina Bosanska Krupa se nalazi u sjeverozapadnom dijelu Bosne i Hercegovine. Graniči sa općinama: Bihać, Cazin, Bužim, Bosanski Petrovac, Sanski Most, Bosanski Novi, Krupa na Uni i Dvor u Republici Hrvatskoj. Međunarodna rijeka Una, koja izvire u Republici Hrvatskoj i malo zatim teče kroz Bosnu i Hercegovinu odnosno njenim sjeverno-zapadnim dijelom jeste i centralna karakteristika općine, kako i Unsko – Sanskog Kantona. Putnim komunikacijama općina je povezana unutar kantona na jug do općine Bihać odnosno i do ostalih graničnih općina i Republike Hrvatske, a šire se nadovezuje na mrežu putnih komunikacija Balkana, Južne i ostalih dijelova Evrope.

PEDOLOŠKE KARAKTERISTIKE ZEMLJIŠTA

Osnove doline Une i bosanskokrupske proširenja sastavljene su od triarskih dolomita i krečnjaka sa primjesama rožnica i gline. Tako je bosanskokrupsko proširenje uokvireno krečnjačkim anfiteatrima jurske starosti.

U kontinentalnom okviru bosanskokrupske općine formiraju se bregovita tla i to:

- smeđa duboka tla i deluvijalna tla vrtača na tvrdim krečnjacima i dolomitima,
- smeđa duboka tla na krečnjacima i dolomitima,
- smeđa plitka tla posmeđena i opodžoljene crvenice na jedrim krečnjacima i dolomitima,
- posmeđene plitke crvenice na jedrim krečnjacima i dolomitima.

U prostornom dijelu centralne površine bosanskokrupske proširenja na vrlo debelim pleistocenskim i aluvijalnim naslagama razvila su se dolinska tla i to:

- aluvijalno-karbonatna tla na pjescima i ilovačama (čine tlo u centru proširenog dijela kotline uz obale Une, uglavnom su to oranice),
- aluvijalno-deluvijalno-bikarbonatna glejna tla (matični supstrat ovog tla je nanos ili pjeskovito-ilovasti sediment, ova tla su pod oranicama i livadama).

KLIMATSKE KARAKTERISTIKE

U bosanskokrupskoj općini vlada kontinentalna klima što se ogleda po visokim temperaturama u ljetnim mjesecima, a srednja godišnja temperatura iznosi 10,8 °C. Takođe postoji vrlo skokovit prelazak temperatura između zime i proljeća (mjesec mart 5,6 °C - mjesec april 11,1 °C).

Jesen je godišnje doba sa najvećom količinom padavina, zatim proljeće, tako da jesen i proljeće predstavljaju vlažne dijelove godine i zajedno imaju prosječno 723 mm/m² padavina. Kiše koje



se izliju za vrijeme proljetnih i jesenjih mjeseci su dugotrajne, tihe, obilne i obično izazivaju poplave.

Snježni period traje u prosjeku 127 dana godišnje. Bosanska Krupa je područje sa visokim procentom relativne i apsolutne vlažnosti zraka.

Dolina Une uvjetuje i pojavu i pravce regionalnih i lokalnih vjetrova. Aproximativni pokazatelji pokazuju, da su najučestaliji vjetrovi iz:

jugozapadnog kvadranta 13,8%,
sjeverozapadnog kvadranta 22,90%.

Olujnih vjetrova dosada nije bilo, a najsnažniji se vjetrovi javljaju u februaru.

DEMOGRAFSKI PODACI

Stanovništvo po mjesnim zajednicama (MZ) 2004 godine je :

R.B	Mjesna zajednica	Broj stanovnika
1	Mahmić selo	2067
2	Jezerski	3505
3	Pištaline	1523
4	Otoka-centar	3080
5	Otoka II	2550
6	Hodžinac	830
7	Krupa II	4320
8	Krupa-centar	4961
9	Zalug	1521
10	Halkići	587
11	Stari grad	1740
12	Zalin	178
13	Arapuša	197
14	Veliki Dubovik	102
15	Jasenica	201
16	Veliki Badić	1691
17	Ostružnica	1203
18	Ljusina	997
19	Ivanjska	454
20	Radić	395
21	Suvaja	251
22	Gornji Petrovići	198
23	Vranjska	222
	UKUPNO	32753

Starosna struktura stanovništva 2004 godine je bila:



Starosna struktura	Do 18 god.		18-35		35-65		65 i više	
		%		%		%		%
2004	12 281	38	8 188	25	9 015	27	3 310	10

Analizom postojećeg stanja došli smo do podatka da je gustina naseljenosti 5,8 stanovnika po km². U općini su bile karakteristične migracije stanovništva kako dnevne i sedmične, tako i stanovništva na privremenom radu u inozemstvu. Po podacima popisa iz 1981. godine sa područja općine na radu u inozemstvu je bilo 2.993 ili 5,4% ukupnog stanovništva. Cijeni se da je situacija danas mnogo drugačija i da je veći broj stanovništva u dijaspori (tačan broj se ne zna).

Prirodni priraštaj općine Bosanska Krupa izgleda tabelarno ovako:

	1990.	1995.	1996.	1997.	1998.	1999.
Živo rođeni	1.035	15	250	358	297	92
Umrli	406	95	90	100	100	15
Prirodni priraštaj	629	-80	160	258	197	77
Umrli dojenčad	17	-	-	1	1	-

Negativan prirodni priraštaj pojavio se 1995. godine zato što je veliki broj beba rođen u Kantonalnoj bolnici u Bihaću. S obzirom da je to bila godina povratka u Bosansku Krupu i nisu bili stvoreni uslovi u "Dому zdravlja" Bosanska Krupa za porođaj beba. Takođe treba napomenuti da se i dalje veliki broj beba rađa u Kantonalnoj bolnici u Bihaću.

Na području općine Bosanska Krupa registrovano je 268 ratnih vojnih invalida sa preko 50% invaliditeta.

Prema evidenciji Organizacije porodica Šehida ukupan broj samohranih majki je 267.

VODOTOKOVI

Pored toka Une i Krušnice za razvoj općine kao i Bosanske Krupe karakteristične su i etaže izvora na kontaktu krečnjačkog okvira pa se javljaju izvori i vrela različitog intenziteta. Tok Une je jako razvođen u bosanskokrupskom proširenju što je posljedica izrazito intenzivne bočne erozije i pojave odnosno izgradnje naplavina sedre.

Na području općine Bosanska Krupa u Unu se ulijeva više potoka, a na sjevernom djelu grada sa desne strane u Unu se ulijeva rijeka Krušnica.

Maksimalan vodostaj se javlja sa intenzitetom i do 5 m relativne visinske razlike, zato visoke vode izazivaju poplave sa dužim ili kraćim intervalima.

Srednji mjesečni nivo vodostaja na Uni iznosi cca 1,84 m, a srednji godišnji cca 1,15m.

Na području Bosanske Krupe, odnosno njene najbliže okoline, javljaju se izvori, karakteristični u dvije etaže. Izvori značajni za ovu etažu u području Bosanske Krupe javljaju se u dolini Krušnice. Djelomično su izvori vezani za gravitacijsku vodu koja kao podzemna voda cirkulira kroz krečnjake kontinentalnog okolnog prostora. Na udaljenosti cca 5 km od grada nalazi se izvor rijeke Krušnice koji je jedan od najjačih u Evropi. Na izvoru je smještena hidrocentrala koja je u funkciji a u vlasništvu je "Elektro distribucije" Bihać.



Opća karakteristika za pomenute resurse je da do sada nisu bili u dovoljnoj mjeri korišteni, odnosno uključeni u razvoj. Ovi su potencijali korišteni nedovoljno (posebno vode), ekstenzivno (zemljište) i sporadično (prirodne vrijednosti).

OSTALI PRIRODNI RESURSI

Zemljište kao prirodni i uslovni resurs za poljoprivrednu proizvodnju zaslužuje veliku pažnju u svim strateškim planovima, projektima, te analizama stanja.

S toga iznosimo podatke o raspoloživosti i zemljišnim površinama na području Općine Bosanska Krupa:

KATEGORIJA	Ha		
Ukupna površina zemljišta	55.715		
Obradivo zemljište	Privatno	Državno	Ukupno
Oranice i bašte	13.269,68	3.615,32	16.885
Voćnjaci	373,37	100,63	474
Livade	2.765,67	1.459,33	4.225
OBRADIVO UKUPNO:	16.408,72	5.175,28	21.584
Pašnjaci	1.933,00	4.277,04	6.210
SVEUKUPNO POLJOPR.:	18.341,72	9.452,32	27.794

Dakle, ukupno poljoprivredno zemljište jeste 27.794 ha što iznosi 49,88% od ukupnog zemljišta područja općine Bosanske Krupe .

Površina Bos. Krupe čini 1,02 % od ukupne površine BiH-e.

POLJOPRIVREDA

Minimalna površina obradivog zemljišta po stanovniku je 0,17 ha u BiH odnosno se približava ovom limitu, a **na području općine Bosanska Krupa obradivog zemljišta po stanovniku je 0,52 ha.**

Kontinuirano su prisutni razni oblici trajne ili privremene promijene korištenja poljoprivrednog zemljišta, što predstavlja velike gubitke u poljoprivrednoj proizvodnji.

Osnovni problem poljoprivrednog sektora su neobrađenost oranica kako na području općine Bosanska Krupa tako i cijele BiH.

U državnom vlasništvu je 3.615 ha oranica, koje treba rješavati na takav način da ta kvalitetna zemlja dođe u ruke zainteresovanih za ekološku/organsku modernu i rentabilnu poljoprivrednu proizvodnju.

Procjenjujemo da na području općine ima oko 5.000 seoskih domaćinstava, da 50 % njih živi isključivo od poljoprivrede, i da nemaju drugih primanja.

Naše poljoprivredne proizvođače karakterišu mali, usitnjeni posjedi, razbacani na 5-6 parcela, što otežava organizaciju proizvodnje i umanjuje njenu rentabilnost.

Pregled broja posjednika zemljišta po veličini:

0-1 ha	1-2	2-3	3-5	5-10	10 i više	ukupno
8.869	2068	1281	1593	1600	588	15.999



Sjetvene površine na području općine se povećavaju iz godine u godinu, u proljetnoj i jesenjoj sjetvi 2004. godine, a prema procjenama pod kulturama je bilo 7.145 ha. Najveće površine zauzimaju djeteline i trave a od žita vodeća kultura je kukuruz.

Na prostorima općine Bosanska Krupa zbog uslova uzgojnog područja i tradicije, dominira ratarsko – stočarska proizvodnja.

Uništeni stočni fond tokom rata, lagano se oporavlja, na što utiču projekti uvoza stoke, kao i reprodukcija stoke u samostalnoj režiji proizvođača.

Prema predratnim podacima, sadašnje brojno stanje stoke predstavlja oko 50 % od predratnog broja, a prema procjeni ono trenutno izgleda ovako:

Brojno stanje stoke:

<i>KATEGORIJA</i>	<i>BROJ</i>
Goveda / krave i steone junice/	5.000
Ovaca	6.000
Konja	150
Koza	300
Svinja	750
Peradi	30.000
Košnica pčela	2.000

Mrežom otkupa mlijeka pokrivena su sva područja gdje ima uslova za organizaciju otkupa, dovoljne količine mlijeka i riješena infrastruktura, otkupljivači su mljekare Megle – Bihać i Milex – Jezerski.

Dobijeni podaci iz mljekara pokazuju sljedeće stanje:

Mljekara	Broj otkup. mjesta	Broj kooper.	Otkupljene kol. Mlijeka lit.
Megle	32	1063	3,334.984
Milex		240	715,016

Podaci obuhvaćaju područje općine za period od 01. 01. 2004. godine do 30. 11. 2004. godine, za isti period u prethodnoj godini otkupljene količine od strane mljekara su iznosile oko 2,5 milijona litara, što pokazuje napredak ove proizvodnje na našem području.

Istraživanja su pokazala da je u 2003. godini uvoz mlijeka i mliječnih proizvoda u BiH za oko 30 puta veći od izvoza, te da BiH uvozi više od 50% svojih potreba za mlijekom i mliječnim proizvodima.

Rješenje ove situacije je u povećanju stočnog fonda, izmjeni pasminskog sastava, povećanju mliječnosti po grlu i povećanju količina otkupljenog mlijeka.

Proizvodnja mlijeka je u BiH-a uslovima motor razvoja ukupne poljoprivrede, uslov za radni angažman stanovništva i iskorištavanje poljoprivrednih resursa. **Ovu proizvodnju moramo tretirati kao strateško opredjeljenje.**

Druga po važnosti je povrtlarska proizvodnja, koja se trenutno nalazi na dosta niskom nivou razvijenosti i uglavnom je proizvodnja za vlastite potrebe domaćinstva. Ova proizvodnja za tržište zaživjet će tek kada se pokrenu prerađivački kapaciteti Agrokomerca iz Velike Kladuše. Rezultati



pokušaja pokretanja proizvodnje za preradu u prethodnim godinama nisu ispunili očekivanja proizvođača. Razlozi tome su niske otkupne cijene proizvoda, skupa modernija proizvodna tehnologija (sistem proizvodnje pod folijom, sistem za navodnjavanje idr.), te sve češća pojava elementarnih vremenskih nepogoda (suša, poplave, grad, mraz), koji su rezultanta djelovanja sistema klimatskih promjena.

Na području općine pokreće se proizvodnja povrća u zatvorenom prostoru - staklenicima i plastenicima. U zadnje dvije godine uz pomoć organizacije Luteranski Savez, proizvođači su postavili 22 plastenika.

Primjećujemo na terenu da poljoprivrednici proširuju ovu proizvodnju nabavkom novih plastenika te smatramo i očekujemo, da bi se ovaj vid proizvodnje mogao razvijati i postati izvor primanja određenom broju porodica, za šta ćemo se i sami zalagati.

Voćarstvo je takođe vid proizvodnje koji treba razvijati na našim prostorima prilagođavajući izbor sorata i vrsta te tehnologiju proizvodnje uslovima proizvodnog područja i zahtjevima tržišta.

Iako se u katastarskoj evidenciji naše općine pod voćnjacima vodi 474 ha površina, možemo reći da su naši postojeći voćnjaci stari, u slabom stanju, oboljeli i heterogeni po zastupljenosti voćnih vrsta, a ujedno sa jako niskim prinosima.

Strukturu zasada i tehnologiju proizvodnje voća treba što prije prilagođavati uvjetima ekološke proizvodnje, jer se voćarska proizvodnja pokazuje kao vrlo rentabilan vid poljoprivredne proizvodnje u BiH, pogotovo u uslovima navodnjavanja.

Voćarska proizvodnja se može organizirati na manjim posjedima uz samozapošljavanje i obezbjeđenje značajnijeg profita po jedinici površine, s toga će se i značajnija sredstva iz budžeta Federacije i USK-a izdvajati za razvoj ove proizvodnje.

Najzastupljenije voćarske proizvodnje su na području općine šljiva i jabuka, čiji se dobar rod bilježi skoro svake godine.

Pčelarstvo je grana poljoprivrede, kojom se na našem području bavi oko 80 proizvođača, koji ukupno imaju oko 2000 košnica pčela. Ovi proizvođači su okupljeni u udruženje pčelara pod nazivom Lipa – Bosanska Krupa.

Interesantan je podatak do koga smo došli nakon snimanja stanja poljoprivrede u BiH, koji govori, da je u okviru poljoprivredne proizvodnje jedino pčelarstvo poslije rata podignuto na viši nivo proizvodnje u odnosu na predratno stanje.

Na području općine postoji ukupno 5 Udruženja poljoprivrednika, prvo osnovano je bilo Udruženje pčelara. U 1999. godini osnovana su dva Udruženja na inicijativu donatorskih organizacija, koje su svoje donacije ili tehničku pomoć uslovljavale formiranjem takvih Udruženja. Tako su bili osnovani Udruženje poljoprivrednika « Agro – Una » u Pištalinama i « Povratnik » na Velikom Badiću.

Oba udruženja su pod nadzorom Kantonalno udruženje poljoprivrednika (KUP-a), koje im je dodijelilo na korištenje mehanizaciju po principu mašinskog prstena - zajedničkog korištenja.

Dosadašnja praksa je pokazala da Udruženja formirana na osnovu vanjske inicijative imaju slabu održivost zbog visokih i nerealnih očekivanja članova Udruženja koji očekuju konkretnu finansijsku pomoć.



U 2003. godini registrovana su još 2 Udruženja: « Jezerski» u Jezerskom i « Aktiv žena Otoka » u Otoci Bosanskoj.

Udruženja poljoprivrednika su važna za razvoj poljoprivrede, daleko je bolje kada nastaju inicijativom samih poljoprivrednika. Njihov cilj je promocija i zaštita interesa proizvođača i njihovog rada.

Na području općine postoje 2 poljoprivredne zadruge: ZZ Krupa i ZZ Otoka, prema informaciji dobijoj od direktora ZZ Otoke, je ta zadruga među prvima na Unsko-Sanskom kantonu, koja je usklađena sa odredbama Općeg Zakona o zadrugama u BiH, koji reguliše problematiku zadrugarstva u BiH.

U skorije vrijeme očekujemo donošenje Zakona o poljoprivredi i Zakona o podsticajima koji će nadamo se uticati na pozitivnije uređenje poljoprivredne proizvodnje.

PRIVREDA – stanje 2004 godina

Općina Bosanska Krupa zauzima površinu od 55 715 ha ili 557 km². Prema načinu korištenja zemljišta općina raspolaže sa 27 794 ha poljoprivrednog i 26 379 ha šumskog zemljišta.

Prema procjeni (2004) općina ima 32 753 stanovnika i 23 mjesne zajednice. Na području općine Bosanska Krupa prema podacima dobivenih od Penzijsko-invalidskog osiguranja i Mirovinsko-invalidskog osiguranje (PIO, MIO) Bihać u septembru 2004 godine bilo je zaposleno 3205 radnika, a u decembru 2004 godine 3100. Iz ovog se vidi da je došlo do smanjenja broja zaposlenih za 105 radnika.

Prema dobivenim podacima na Birou za zapošljavanje evidentirano je 3443 lica koji traže posao. Prosječni lični dohodak za 11 mjesec na općini Bosanska Krupa iznosio je 520,47 KM.

Na osnovu podataka dobivenih iz Porezne uprave Bosanska Krupa na području općine registrirano je 619 pravnih subjekata i to:

❖ DOO		344
❖ Zanatske radnje	61	
❖ Ugostiteljske radnje		82
❖ Trgovačke radnje		67
❖ Auto-prevoznici	11	
❖ Poljoprivredna djelatnost		16
❖ Knjigovodstvena djelatnost		16
❖ Advokatska djelatnost	7	
❖ Stomatolozi i apoteke		5
❖ Ostale djelatnosti		10

UKUPNO		619

Stopa zaposlenosti na području općine je 13,63% od radno sposobnog stanovništva (15-65 godina starosti).

Shodno našim raspoloživim prirodnim resursima i ljudskim potencijalom u toku ove godine urađen je STRATEŠKI PLAN RAZVOJA OPĆINE BOSANSKA KRUPA u kojem su određene 3 strateške grane razvoja i to: prerada drveta, poljoprivreda sa akcentom na stočarstvu, i turizam. Naravno nisu zapostavljene ni ostale grane privređivanja a kao što su građevinarstvo, promet roba i metaloprerađivačka industrija, koje će dati svoj doprinos u zapošljavanju i razvoju općine.



VODOOPSKRBA

Gradskim vodovodnim sistemom upravlja Javno Komunalno Preduzeće - JKP „10. Juli“, i ono vodom snabdjeva preko 4 100 domaćinstava. Ukupna količina vode koju ovo preduzeće zahvata i pumpa sa svojih izvorišta iznosi 102 l/s. Ova količina vode je prosječna količina u toku cijele godine. Tokom čitave godine naš sistem radi tako da nemamo redukcija niti obustava. Sistem je podijeljen u sedam zona u koje se dovode sljedeće količine vode:

• Krupa I – Zona I	63	l/s
• Krupa II – Zona II	23,5	l/s
• Otoka – Zona III	12	l/s
• Ostružnica (lok. vodovod) – Zona IV	1,5	l/s
• Veliki Badić – Zona V	1,5	l/s
• Ljusina –Hasanagić Selo – Zona VI	0,5	l/s
• Crkvina – Zona VII	0,5	l/s

Pomenute količine vode zahvataju se sa sljedećih vodocrpilišta:

- Ade
- Luke
- Zidina
- Dobrović

Tendencija je da vodocrpilište Ade bude glavno vodocrpilište za općinu Bosanska Krupa.

KVALITET VODE

Kontrola kvaliteta uzoraka sirove vode, kao i uzoraka vode sa mreže izvršene u toku 2002. godine su pokazivale da nema većih zagađenja kako na sirovoj vodi, tako na vodi na kojoj je izvršena dezinfekcija, osim u zonama III, VI i VII koje se snabdijevaju sa izvorišta Zidine. Ovo izvorište kontaminirano je i analize pokazuju povećanje koncentracije amonijaka. Radi toga ovih dana su pri kraju aktivnosti na povezivanju vodovoda Bosanske Krupe i Bosanske Otoke, tako da će i ove zone u narednom periodu imati kvalitetnu vodu.

Fizičko hemijske analize sirove vode na ostalim izvorištima ne pokazuju pogoršanje, osim u nekim slučajevima gdje dolazi do pojave bakterija svježeg fekalnog porijekla, sto ukazuje da instalacije u istim nisu ispravne. Preduzeće vrši redovnu analizu na 16 mjesta raspoređenih u svim zonama i uzima sirove uzorke vode sa tri izvorišta, osim izvorišta Zidine koje je kontaminirano i nema potrebe da se uzima uzorak. Bez obzira na vremenska pogoršanja naša izvorišta nisu mijenjala kvalitet. U posljednjih 5 godina u higijensko epidemiološkoj službi Doma zdravlja Bosanska Krupa nije zabilježen niti jedan slučaj zaraznog oboljenja, koje bi upućivalo, da je zaraza nastala zbog nekvalitetne vode.

DISTRIBUTIVNA MREŽA

Distributivni vodovodni sistem Bosanske Krupe je prilično dugačak (oko 71 km osnovne mreže), a cjevovodi su rađeni od različitih materijala (lijevano željezo, azbest, cement, PVC, PE, čelik, pocinčano i daktinolijevano željezo). Najstariji dio mreže se nalazi u Zoni I, tj. u centru grada, gdje imamo i velike gubitke, jer u istoj zoni nalaze se dvije vodovodne mreže –



stara i nova, koja je izgrađena donacijom EU. Obe mreže su u funkciji, s tim što se na staroj vodovodnoj mreži nalaze svi priključci, pa je iz tog razloga ona još uvijek u funkciji. U čitavom sistemu praktično je isti pritisak (PN 7), osim u višim područjima koji se nalaze na sistemu prepumpnih stanica gdje su pritisci različiti. Postoje još neke gradske zone, koje nisu obuhvaćene vodovodnim sistemom, za koje je potrebno izraditi prepumpne stanice. U zoni I jedna prepumpna i u zoni II dvije prepumpne stanice.

Dužina vodovodne gradske mreže:

Cjevovod	Dužina - km	Profil	Godina izgradnje
Glavni prenosni cjevovod	1,2	350	1984,1999
Primarni distributivni sistem	16	200	1957 i dalje
	14	150	1957 i dalje
	14	100	1957 i dalje
	11	80	1957 i dalje
Sekundarni distributivni sistem	15	50	1957 i dalje
Tercijarni distributivni sistem	20	< 50	1957 i dalje
UKUPNO	71,2		

GUBICI U VODOVODNOJ MREŽI

Preduzeće ima veoma velike gubitke u vodovodnoj mreži prvenstveno iz razloga dijela lošeg vodovodnog sistema koji je u funkciji, i iz razloga povećanja pritiska u mreži koje je došlo puštanjem u rad bazena HUM kapaciteta 2000 m³. Veliki gubici, kako smo već ranije napominjali, nalaze se u zoni I – Krupa I iz razlog postojanja dvije mreže (stara i nova). Također su problem kolektivni stambeni objekti, gdje su velike migracije stanara.

KANALIZACIJA

Problem kanalizacije možemo smatrati najvećim infrastrukturnim problemom na području naše općine, jer se stanje može slobodno nazvati kritičnim. U Bosanskoj Krupi nakon rata veliki dio kanalizacione mreže je ostao začepljen, a preduzeće ne posjeduje adekvatnu mehanizaciju za pročišćavanje kanalizacije. Za Bosansku Otoku se slobodno može reći da nema kanalizaciju primjerenu gradskom naselju. Budući da su mnogi kanalizacioni vodovi nekvalitetno izgrađeni i postoji istjecanje fekalnih voda iz njih, smatramo da postoji potencijalna opasnost kontaminiranja zaliha podzemne pitke vode. Također, na području naše općine ne postoje nikakva postrojenja za pročišćavanje otpadnih voda, već se one direktno ispuštaju u recipient.

Skoro sve površinske vode koje se prikupljaju sa javnih površina su spojene na gradske fekalne kolektore, što čini mješoviti sistem odvodnje otpadnih voda. Najveći nedostatak postojećeg sistema je taj, što se u toku zimske službe abrazivni materijal nakuplja u uličnim slivnicima i kanalizaciji.

Na osnovu svega ovoga smatramo da bi bilo potrebno obnoviti i prilagoditi postojećem stanju idejni projekat kanalizacije, koji je prije rata urađen za Bosansku Krupu, i isti takav uraditi za Bosansku Otoku, te planski rješavati pojedina područja, koja bi na kraju činila cjelovit i povezan sistem. Također



bi bilo nužno u naseljima seoskog karaktera pokrenuti rješavanje odvodnje otpadnih voda barem u tolikom obimu, da se zaštite njihova lokalna izvorišta, te spriječiti moguće izbijanje epidemija.

KRUTI OTPAD

Trenutno se na području naše općine vrši odvoz krutog otpada na uređenu deponiju Krivodol, koja je udaljena cca. 12 km od Bosanske Krupe. Deponija zauzima površinu oko 1,8 ha i ima kapacitet od 165000 m³. Koristi se od 2000 godine, kao zajednička deponija za općine Cazin, Bužim i Bosanska Krupa. Na njoj se odlaže samo otpad iz domaćinstava i ustanova, dok se opasni otpad (medicinski, hemijski itd.) na njoj ne tretira. Prema procjenama deponija je zapunjena oko 50% i sa ovakvom dinamikom zapunjavanja ona će biti iskorištena do kraja 2006. godine.

Komunalno preduzeće namjerava do kraja godine, da uvede moderniji sistem prikupljanja i razdvajanja krutog otpada, te s tim stvori pretpostavke za reciklažu plastike, papira, stakla i metala.

OSNOVNA OPASNOST ZA STANOVNIŠTVO JE DJELOVANJE SISTEMA KLIMATSKIH PROMIJENA, KOJI ĆE SVE VIŠE BITI PRISUTNE U NAŠEM ŽIVOTU. VIŠE O TOME ĆE BITI U DIJELU O SISTEMU KLIMATSKIH PROMIJENA, ALI OVDJE JE POTREBNO NAPOMENUTI, DA SLIJEDEĆI SADRŽAJI SE VEŽU NA POTREBE STANOVNIŠTVA I ZAŠTITU OD KLIMATSKIH PROMIJENA. SAMO SI PREDSTAVITE, DA DOĐE VJETAR SA BRZINOM KRETANJA OD 200 KILOMETARA NA SAT. ŠTO BI SE SVE DESILO U BOSANSKOJ KRUPI ILI OTOCI. ZATO SE PREDLAŽU SADRŽAJI KOJI SLIJEDE.

2. Komunalna (Komunalna infrastruktura) općine Bosanska Krupa

Sadržaji, koje bi bilo potrebno urediti su:

2.1. KANALIZACIJA

Sistem kanalizacije bi bilo potrebno, da ima namjenu za transport pročišćene vode i atmosferskih voda SAMO. Sadašnja mreža kanalizacije uz određene promijene bi se promijenila u tehničku kinetu ili sistem za transport/opskrbu/prenos sive vode (sve vode koje uključuju atmosferske vode i primarno pročišćene otpadne vode), dovod pitke vode, dovod tople vode za opskrbu sa toplotom iz sistema daljinskog zagrijavanja, električne energije, komunikacijskih vodova (telefon, kabela TV, i drugi). Tehnička kineta kao sastavni dio grada je trajno rješenje i potrebno je pažljivo planirati kapacitete.

Sistem prečišćavanja otpadnih voda počinje sa edukacijom stanovništva, da prihvati korištenje vode na način, da je ne koristi bez organičenja (navike kod korišćenja – klasična navika je, da voda teče za sve vrijeme toaletne upotrebe – A NIJE POTREBO). Druga važna činjenica je, da se sve tekućine, koje se ne koriste više u domaćinstvima i ostalim korisnicima kanalizacijskog sistema (kozmetika, boje i lakovi, industrijski zagađivači, pesticidi, lijekovi, itd.), odstranjuju izljevom u lavabo. Tako dolazi do zagađivanja otpadne vode sa čak i vrlo opasnim tekućim sredstvima, koja otežavaju primarno pročišćavanje. Treća važna činjenica je, da se zbog djelovanja sistema klimatskih promjena količina pitke vode ne povećava nego SMANJUJE. Pametan gospodar će u takvom primjeru organizirati racionalnu upotrebu raspoložive vode – od dovoda vode do korištenja, pročišćavanja i korištenja sive vode (sva voda poslije primarnog pročišćavanja), do ispusta vode u prirodni recipijent (Una/Krusnica).

Poslije izljeva vode iz domaćinstava ili ostalih korisnika se ta na najbližem mogućem mjestu pročišćavanja u sistemu sanitarnih močvara. Pred pročišćavanjem taloži se čvrsti dio u taložnicima a tekući dio se pusta kroz sanitarnu močvaru. Tako dobivamo primarno pročišćenu sivu vodu, koju na određenim lokacijama možemo dodatno pročišćavati u sistemu sekundarnog pročišćavanja u sanitarnim



močvarama. Tu postoji mogućnost kombinacije sistema od sanitarnih močvara do sanitarnih jezera. Sljedeća faza je odvodnja sive vode do korisnika ili izljeva u prirodni recipijent.

Poseban sadržaj (u knjizi se nalazi uokviren i na svojoj stranici)

Ujedinjeni narodi u naporima za unapređenje uvjeta života na Zemlji donijeli su osam milenijskih ciljeva, koji bi trebali biti dostignuti do 2015 godine. Ciljevi su sljedeći:

SA 2015 GODINOM SE TREBA PREPOLOVITI BROJ LJUDI, KOJI SU UGROŽENI SA:

- 1. SIROMAŠTVOM I MANJKOM HRANE,**
- 2. NEPISMENOST,**
- 3. NEJEDNAKOST SPOLOVA (MUSKARCI I ŽENE),**
- 4. SMRTNOST DJECE,**
- 5. OBOLJEVANJE I UMIRANJE TRUDNICA I RODILJA,**
- 6. ŠIRENJE AIDSA, MALARIJE I OSTALIH BOLESTI**
- 7. DJELOVANJA PROUZROKOVANA SA PREKOMJERNIM ISKORIŠTAVANJEM PRIRODNIH RESURSA,**
- 8. DJELOVANJA PROUZROKOVANA SA MANJKOM SURADNJE GLOBALNOG PARTNERSTVA ZA RAZVOJ.**

VAŽNA JE NAPOMENA, DA VEĆINA SPOMENUTIH UGROŽAVANJA NASTAJU DIREKTNO ILI INDIREKTNO RADI MANJKA NEODGOVARAJUĆE OPSKRBE SA PITKOM VODOM I SANITARIJAMA.

Osam milenijski ciljeva su vezani na Povelju o ljudskim pravima, i tako nalazimo današnju općinu Bosanska Krupa u drugoj polovini čovječanstva odnosno u polovini, koja nema ljudskih prava za postizanje milenijskih ciljeva. Tako ova Agenda 21 za trajno održivu budućnost područja općine Bosanska Krupa predstavlja i napore stanovništva za postizanje prava na ljudska prava po deklaraciji Ujedinjenih naroda.



Osnovni princip je, da se otpadne vode pročišćavaju čim bliže mjestu zagađivanja.

Uz sistem takovog pročišćavanja otpadnih voda dobivamo relativno velike količine čvrstog dijela tekućih otpadnih voda, koji se koristi u sistemu kompostiranja za održavanje kvalitete poljoprivrednih, komunalnih i rekreativnih površina. Kompostiranjem se rješava korištenje sadržaja kanalizacijskih taložnika.

Siva voda zajedno sa atmosferskim vodama se koristi na brojne načine od sredstva za protiv-požarnu zaštitu na području suma (izrada umjetnih jezera za korištenje vode u slučaju šumskog požara, izrada umjetnih jezera za korištenje vode za namakanje poljoprivrednih površina, održavanje komunalnih i rekreativnih površina u smislu namakanja, korištenje za čišćenje gradskih površina – putevi, zalijevanje parkovnih i rekreativnih površina, itd).

Tehnička kineta i sistemi, koji se uvode na taj način, imaju vrlo veliki značaj za dizanje kvalitete života stanovništva.

PRIJEDLOG PROJEKATA

1. Tehnička kineta – sistem za gradsko područje Bosanske Krupe i Otoke Bosanske sa podsistemima za:

- transport pitke vode,
- transport sive vode,
- povezivanje sistema za snabdijevanje sa električnom energijom,
- povezivanje sistema za opskrbu za žičanom telefonijom i kablovskim informacijama,
- povezivanje sanitarnih sistema primarnog i sekundarnog pročišćavanja otpadnih voda i sistema za korištenje sive vode,
- transport toplotne energije iz daljinskog ofrevanja.

2. Šumski, seoski, prigradski i gradski zadrživači vode (siva voda poslije pročišćavanja i atmosferske vode) – za korištenje u namijene po potrebi.

3. Zaštita prirode, prostora i okoliša od zagađivanja sa otpadnim vodama – izrada sanitarnih močvara prije puštanja bilo kojih voda iz humanog eko sistema u prirodne recipijente (ocijedne vode iz deponija smeća, vode iz područja cesta i većih površina – trgovi, aerodromi itd, mostovi, autoceste itd, industrija, poljoprivreda, turizam, ugostiteljstvo, prehrambeno-prerađivačka industrija itd).

4. Zaštita šuma, sela, prigradskih i gradskih područja od požara.

5. Recikliranje materije iz čvrstog dijela otpadnih voda kompostiranje i preradom za korisne namjene. Ovaj pod-projekat se veže sa dijelom biološkog otpada kod sistema komunalnog otpada i otpada kod integralnog upravljanja sumama i parkovima.

2. 2. KOMUNIKACIJE

Linije za prenos podataka žičani telefon, kablovska televizija i druge, postaju sadržaj tehničke kinete i tako prelaze u sistem veće zaštite i lakšeg korištenja.

Posebno je važna ova zaštita radi djelovanja sistema klimatskih promjena, koji radi orkanskih vjetrova može katastrofalno djelovati na nadzemne sisteme žica.



PRIJEDLOG PROJEKTA

1. IZRADA PROJEKTA I PROVEDBA PRENOSA SVIH ŽICA U ZAŠTIĆENI PROSTOR ISPOD POVRŠINE ZEMLJE, KORIŠTENJEM SISTEMA TEHNIČKE KINETE (TEHNIČKIH KINETA).

2. 3. OTPAD

Tu govorimo o komunalnom otpadu u širokom smislu. Prije svega potrebno je dati potporu naporima kantonalne uprave, da se organizuje zajedničko zbrinjavanje otpada. Otpad se rješava po sadržajima opasan, glomasti, iz domaćinstva, biološki, industrijski itd. sa namjerom, da se omogući recikliranje. Mislimo, da bi bilo moguće koristiti prije svega dvije komponente toga sistema i to:

- sadržaje iz taložnika – kompostiranje i ostalo kompostiranje materija iz područja općine Bosanska Krupa, i
- drveni otpad – kao energent za daljinsko zagrijavanje.

Mislimo, da bi se općina Bosanska Krupa kandidirala za ta dva sadržaja.

PRIJEDLOG PROJEKATA

1. Potpora naporima Unsko – Sanske vlade za zajedničko rješavanje problematike otpada na području kantona. Suradnja na dijelovima koji se mogu rješavati lokalno – kompostiranje, korištenje drvnog otpada kao energent za daljinsko grijanje itd.

2. 4. CESTE

Sadašnje ceste imaju samo djelomičnu funkcijsku formu. Predstavljaju opasnost stanovništvu i noćnu moru svih majki pred opasnošću za djecu. Pametnim programom bi bilo potrebno urediti putne komunikacije i to:

- gradske ceste, da imaju pločnike, biciklističke staze, kosine za potrebe korištenja invalida, semaforizaciju, postavljanje pješačkih prelaza i zelene površine,
- međugradske ceste, da imaju biciklističke staze, odvodnju atmosferskih voda i pročišćavanje otpadnih voda, signalizaciju i sisteme zaštite,
- autoceste, da ne dolaze u mjesta, nego se izgrađuju zaobilazne autoceste po standardu potrebnom za provođenje transporta.

Konkretno za Bosansku Krupu i Otoku potrebno je revidirati planove u smislu provedbe transporta izvan gradskih područja, a gradski transport je potrebno regulirati u smislu zaštite stanovništva i invalida.

Gradski i međugradski transport stanovništva je potrebno organizirati energetske racionalno i vremenski primjerno. Velika prednost međugradskog transporta je u postojećoj željeznici a gradski i međugradski prijevoz putnika još čeka, da bude organiziran.

PRIJEDLOG PROJEKATA

1. Projekt uređenja gradskih ulica i komunikacija za Bosansku Krupu i Otoku Bosansku.



2. Projekta kantonskih autocesta sa zaobilaznim autocestama za Bosansku Krupu i Otoku Bosansku.

3. Projekt izgradnje željeznice sa dva kolosijeka kao glavne regionalne komunikacije za prevoz roba i putnika na relaciji Bihać – Bosanski Novi, i moguće povezivanje sa ostalim komunikacijama.

2. 5. ENERGETIKA - SNABDIJEVANJE SA ELEKTRČNOM ENERGIJOM

Sve vidne dijelove sistema snabdijevanja sa elektrikom bi bilo potrebno urediti tako, da se snabdijevanje sa elektrikom omogući u sistemu tehničke kinete.

PRIJEDLOG PROJEKTA

1. Projekt prenosa i snabdijevanja sa električnom energijom sa zaštićenim podzemnim sistemom – zajedničko korištenje tehničke kinete.

2. 6. GRADSKI TRANSPORT

Sistem gradskog transporta je potrebno organizirati u smislu servisa za stanovništvo, koje uključuje i dodatke za omogućenje transporta invalida (klečeći autobusi i autobusi sa platformom za invalide u invalidskim kolicima, itd).

2. 7. GRIJANJE

U smislu racionalnog korištenja prirodnih resursa predlažemo, da se organizuje daljinsko grijanje na primjernoj prigradskoj lokaciji (Vranjska). Sistem daljinskog grijanja bi koristio bio masu kao energent a tu bi dobivao od čišćenja šuma i prerade drvenog otpada. Danas u Evropi su najviše postigli u Austriji i predlažemo, da se za taj sadržaj povežemo preko ambasade Republike Austrije.

Organizacijom daljinskog grijanja imali bi slijedeće prednosti:

- Smanjivanje pritiska na prirodni resurs – sume,
- Povećanje kvalitete zraka – rezultanta prestanka loženja po stanovima i kućama u gradu,
- Smanjenje troškova života,
- Korištenje tehničke kinete za transport toplote itd.

PRIJEDLOG PROJEKTA

1. Projekt daljinskog grijanja i transporta toplotne energije na području Bosanske Krupe i Otoke Bosanske.

2. 8. GRADSKA ČISTOĆA, UREDJENOST I ODRŽAVANJE ZELENIH POVRŠINA

Korištenjem sive vode za održavanje gradske čistoće, uredenosti grada i zelenih površina smanjili bi korištenje pitke vode u te namjene, i omogućili bi prilagođavanje potreba mogućnostima.

2. 9. PROTIV POŽARNA ZAŠTITA

Izradom sistema protiv požarne zaštite gradskih, prigradskih, seoskih i prirodnih (sume i poljoprivreda) okruženja korištenjem sive vode imali bi velike prednosti i to:



- racionalizacija,
- pojeftinjenje,
- smanjenje pritiska na prirodni resurs,
- povećavanje vrijednosti sistema suma i poljoprivrede,
- korištenje sistema suma i poljoprivrede u težim uvjetima – suše,
- povećavanje proizvodnosti u poljoprivredi,
- povećanje akumulacije vode u uvjetima djelovanja sistema klimatskih promjena je osnovni način rješavanja dijela problematike sistema klimatskih promjena, itd.

3. MJESTA I NASELJA

Prirodno okruženje i socijalni – ekonomski – društveni sistem djeluju usporedno i recipročno, tako danas predstavljaju gradovi (megapolisi ili velegradovi i ostali, kao i sam sistem naseljavanja stanovništva u gradove) veliki rizik u uvjetima djelovanja prirodnih snaga sa rušilačkim jačinama/sposobnostima. Tako mislimo, da je potrebno pažljivo planirati odnos između gradskog i prigradskog stanovništva i stanovništva u selima i naseljima. Ako želimo imati bolje sutra mislimo, da je bolje imati statični grad i dinamično selo.

4. RJEKE UNA I KRUŠNICA

Razlika između područja općine Bosanska Krupa i ostalih dijelova svijeta je u sadržaju prirode, koji dopunjavaju sa svojom kvalitetom Una u protoku kroz područje općine i Krušnica, koja je u potpunosti općinska voda.

Rijeka Una je sastavni dio ove Agende 21 ali za kvalitetu sadržaja potrebno je surađivati sa svim korisnicima riječnog bogatstva od Republike Hrvatske (Izvorište je u Republici Hrvatskoj) do svih općinskih i kantonalnih područja uzvodno od Bosanske Krupe a po interesu nizvodnih stanovnika i njih. Agenda 21 bi postavila program suradnje ili Agenda 21 za porječje rijeke Une, a dio koji se nalazi na području općine Bosanska Krupa bi bio u sastavu ovog dokumenta.

Rijeka Krušnica bi bila dio Agende 21 za dolinu rijeke Krušnice i dio rijeke Une uz završni dio Krušnice, koju bi izradili zainteresirani građani i Eko Riba Krušnica d.d. a uz suradnju sa autorom ove Agende 21.

Poseban sadržaj (ovaj dio se nalazi uokviren na svojoj stranici)

DJELOVANJE SISTEMA KLIMATSKIH PROMJENA

Na području općine Bosanska Krupa kao i šire, sistem klimatskih promjena može prouzrokovati sljedeće promijene:

- veća opasnost jačih zemljotresa – potrebno je ugraditi protiv – potresnu izgradnju svih građevina,
- pojava poplava – izvan običnih termina i sa većim razornim djelovanjem radi većih količina vode. Sva zemljišta na ugroženijim lokacijama bi bilo potrebno dodatno zaštititi sa kamenim ili čvrstim zidanim preprekama za sprječavanje otplavlivanja zemlje kod poplava. Isto tako je potrebno pregledati naselja i gradove iz pogleda visokih poplava i primijeniti odgovarajuće mjere zaštite,



- pojava suša može štetno djelovati na cijelu biosferu područja općine. Potrebno je povećati bio sadržaj poljoprivrednih zemljišta i zelenih površina. Isto tako sa zadrživačima vode (zajednički za protiv-požarnu zaštitu i navodnjavanje) omogućiti navodnjavanje,
- erozija zemljišta, dezertifikacija, gubitak plodnosti su obično rezultante djelovanja sistema klimatskih promjena,
- povećavanje srednje prosječne temperature rezultira promjenama u poljoprivredi, voćarstvu i šumarstvu. Potrebno je stalno unapređivati vrste biljaka i drveća u poljoprivredi, šumarstvu i voćarstvu, kako bi pravovremeno djelovali u smislu zaštite,
- radi povećanja srednje prosječne temperature se smanjuje plodnost zemljišta. Potrebno je stalno povećavati biološki sadržaj zemljišta i pratiti rezultate proizvodnje, da se može pravovremeno djelovati u smislu zaštite,
- nadmorska visina poljoprivrednih zemljišta određuje upotrebljivost istih u uvjetima djelovanja sistema klimatskih promjena. Tako sa vremenom će se povećavati plodnost više ležećih površina,
- općenito se može u kratko rezimirati djelovanje sistema klimatskih promjena tako, da se jug siri na sjever sa brzinom od 100 kilometara na godinu a u visinu sa promjenama od 100 metara u visinu na godinu,
- pojava jačih pa i orkanskih vjetrova će postati prateći dio života. Potrebno je sve sadržaje života u humanoj eko sferi provjeriti, kako bi se spriječile teške posljedice djelovanja jačih vjetrova na sadašnje običaje izgradnje, održavanja i sadržaje ranjive na jake vjetrove.

5. ŠUME

Poseban program integralnog upravljanja sa sumama na području općine bi bilo potrebno izraditi u suradnji sa kantonalnim i federacijskim stručnjacima.

PRIJEDLOG PROJEKTA

Izrada projekta «Integralno upravljanje sa šumama na području općine Bosanska Krupa» u suradnji sa kantonalnim i federacijskim institucijama.

6. ENERGETIKA

Veći značaj je potrebno dati korištenju energije u smislu energetske manje potrošnje aplikacija – žarnice, aparati, itd. Svakako je i program daljinskog grijanja jedan od tih sadržaja. Tehničke i tehnološke osnove pokrivanja potreba i načina korištenja je potrebno preraditi u smislu manje potrošnje, smanjivanja utjecaja na prirodu itd.

PRIJEDLOG PROJEKTA



Izrada projekta dobave električne energije po sistemu zaštićenog podzemnog prenosa u sistemu tehničke kinete.

7. POLJOPRIVREDA

Sadašnju poljoprivredu je potrebno urediti u smislu potpunog prelaska na ekološku – organsku – biološku poljoprivredu. Tako bi se direktno smanjio utjecaj sintetičnih kemjiskih sastavina na prirodu. Predlažemo izradu projekta uvođenja ekološke poljoprivrede na principima Evropske Zajednice.

PRIJEDLOG PROJEKATA

- 1. Izrada projekta «Ekološka poljoprivreda na području općine Bosanska Krupa»**
- 2. Izrada projekta «Zaštita poljoprivredne proizvodnje u uvjetima djelovanja sistema klimatskih promjena»**
- 3. Izrada idejnog projekta za proizvodnju ječma i izgradnju tvornice za doradu ječma u slad.**

8. ŠKOLSTVO

Školstvo u sadašnjem smislu ovisi od federalnog i kantonalnog sistema. Mislimo, da na području općine Bosanska Krupa možemo uključiti sadašnje školstvo u provedbu Agende 21. Tako bi kroz suradnju dobili druge kvalitete razmišljanja mladih ljudi poslije zaključivanja sistemskog školovanja.

Drugi dio školstva ili učenje kroz cijeli život je sadržaj, koji bi zahtijevao izradu posebnog projekta. **«Učenje za vrijeme cijelog života».**

Osnovna misao je izlazak iz sadašnjeg stanja, koji se može predstaviti ovako:

« Svi mi znamo ono što nas je majka naučila u ranom djetinjstvu, ono što smo se naučili u školi i ono što nas je naučio život».

Znaci prvo pokušajmo majkama dati bolju mogućnost, da se bave sa djecom u ranom djetinjstvu - učenje majki, da znaju bolje uzgajati djecu; zatim u školama primijenimo sistem teoretskog i praktičnog učenja, kroz suradnju na različitim provedbenim sadržajima; i treće omogućimo učenje kroz cijeli život – teoretski i praktički sadržaji na teme od značaja za trajno održivu budućnost.

PRIJEDLOG PROJEKTA

- 1. Uskladiti srednjoškolsko obrazovanje sa potrebama strateških pravaca razvoja općine Bosanska Krupa, čime bi se izbjegla hiperprodukcija kadrova koji nemaju perspektivu u zapošljavanju.**

9. KULTURA

Kulturne aktivnosti na području općine se provode kroz rad amaterskih društava i JU Centar za kulturu. Očigledni su pozitivni trendovi koji su ogledaju u velikom broju već tradicionalnih manifestacija koji okupljaju anonimne i renomirane umjetnike.

10. ZDRAVSTVO



Na području općine stanovništvo ostvaruje prvenstveno primarnu zdravstvenu zaštitu u zdravstvenim stanicama i ambulantama. Veći dio sekundarne zdravstvene zaštite ostvaruje se u Kantonalnoj bolnici u Bihaću.

Reforma primarne zdravstvene zaštite ide u pravcu porodične medicine, odnosno poboljšanju odnosa između pacijenta i ljekara.

PRIJEDLOG POROJEKTA

- 1. Izraditi projekat «ZDRAVLJE ZA SVE», koji se temelji na jednakosti, promociji i prevenciji učešću zajednica, međusektorskoj suradnji, primarnoj zdravstvenoj zaštiti i međuteritorijalnoj suradnji.**

11. TRANSPORT

Sadašnji sistem transporta postao je najveći zagađivač naše civilizacije. Pokušajmo na našem području taj sistem koristiti u smislu zaštite i ne zagađivanja.

PRIJEDLOG PROJEKATA

- 1. Izrada idejnog projekta auto-cesta općine Bosanska Krupa sa obilaznim auto-cestama Bosanske Krupe i Otoke Bosanske»**
- 2. Izrada idejnih i provedbenih projekata gradskih ulica i trgova Bosanske Krupe i Otoke Bosanske u suradnji sa projektom tehničke kinete.**
- 3. Izrada idejnog i provedbenog projekta unapređenja željezničkog prevoza sa izgradnjom dva kolosijeka željezničke pruge na razdaljini od Bosanskog Novog do Bihaća.**
- 4. Izrada idejnog i provedbenog projekta prevoza kamionskih prevoza po željeznici.**
- 5. Izrada idejnog i provedbenog projekta prevoza putnika u željezničkom transportu na relaciji od Bosanskog Novog do Bihaća.**

12. PRIVREDA

Privreda nije bogaćenje nego održavanje! Potrebno je prilagođavanje privrednih djelatnosti sa potrebama zaštite prirode, prostora i okoliša, kao i djelovanju sistema klimatskih promjena.

PRJEDLOG PROJEKTA

- 1. Izrada idejnog projekta industrijskih zona i raznih trgovačkih centara na lokacijama Ljusna-Pištaline sa obe strane regionalnog puta i Vranjska –Radić sa obe strane buduće magistralne ceste Bihać –Bosanska Krupa**
- 2. Izrada idejnog projekta uzgoja i otkupa ljekovitog bilja.**

13. TURIZAM

Mislimo, da je izrađeni program dobar i da se koristi kao okvir i za ovu Agendu 21.

PRJEDLOG PROJEKTA

- 1. Izraditi idejni projekat povezivanje Malih ada u centru grada Krupa visećim mostovima.**
- 2. Izraditi idejni projekat rekreativnih staza na Velikoj adi i uz obale rijeke Krušnice.**
- 3. Izraditi idejni projekat šetališta Kej –Sokak.**



12. SPORT I REKREACIJA

Nivo korisnika visokih potencijala Une i Krušnice za sport i rekreaciju je direktno vezan na opće stanje društvenog – ekonomskog – socijalnog sistema, kao i sistema zaštite prirode, prostora i okoliša. Za promicanje kapaciteta potrebno je sastaviti i sve prateće sadržaje, a to je osnova ove Agende 21.

14. ZASTITA PRIRODE, PROSTORA I OKOLIŠA

Postavljanje ČOVIJEKA kao osnovne vrijednosti bogatstva područja predstavlja kvalitetu, koja prati ovaj dokument.

Zaštita prirode, prostora i okoliša je okvir za postojanje civilizacijske zajednice. Posebno dajemo važnost sadržaju djelovanja sistema klimatskih promjena. Mislimo, da je tragična nesreća djelovanja tsunamija pokazala snagu prirode. Zato dajemo svima u razmišljanje, da je osnova ove Agende 21 zaštita stanovnika, kao osnovnog bogatstva.

Na području općine Bosanska Krupa potrebno je prihvatiti pravila, zakone, podzakone i propise iz područja zaštite prirode, prostora i okoliša, koje je donijela i koje će donositi Evropska zajednica.

PRIJEDLOG PROJEKTA

1. Prilagođavanje zaštite prirode, prostora i okoliša područja općine Bosanska Krupa sistemu zaštite prirode, prostora i okoliša Evropske zajednice.
2. Izraditi idejni projekat «Table sa natpisima grada, naselja javnih uslužnih i sličnih objekata da se izrade od drveta», jedan mali korak ka ekološkoj općini.
3. Pokrenuti inicijativu da općinsko vijeće donese odluku o zabrani upotrebe PVC vrećica u trgovinama odnosno obavzu upotrebe papirne ambalaže.

GENERALNI PRINCIP

U IZRADI I PROVEDBI SVIH PROJEKATA VEOMA VAŽNU ULOGU SE TREBA POSVETITI EDUKACIJI STANOVNIŠTVA KAO TEMELJU ZA PROVEDBU AGENDE 21.

ZAKLJUČAK

Mislimo, da program razvoja bez greške je rođen mrtav. Zato molimo, da svi vi koji mislite, da možete pomoći, pomognite.

Isto tako molimo sve da surađuju na pripremi, provedbi, održavanju i kontroli uređenja prirode, prostora i okoliša područja općine Bosanska Krupa provedbom dobro pripremljene Agende 21 za



trajno održivu budućnost područja općine Bosanska Krupa i tako doprinesete budućnosti vlastitih potomaka.

Trajno održiva budućnost predstavlja osnovu života danas, kao i sutra. Tako je jedan od mogućih sistema za postojanje naših potomaka i kasnije, kada nas ne bude više.

Mislimo, da sa ovom Agendom 21 omogućavamo početak tranzicije područja općine Bosanska Krupa za život danas i sutra u uvjetima socijalnog, društvenog i političkog trenutka i stanja prirode, prostora i okoliša danas i za sutra.

Učiti, učiti i učiti je formula uspjeha, koja predstavlja razliku iz drugog milenija u treći milenij. Ta razlika je ona, koja će odlučivati o uspjehu sutra u trećem mileniju.

Stanje prirode, prostora i okoliša će biti osnova života generacija za nama. Pokušajmo primopredajom prirode, prostora i okoliša od nas na naše potomke, i njima omogućiti život.

Međusobna ovisnost, djelovanje i suradnja ljudi i prirode područja općine, kantona, federacije i šire Evrope i ljudi svijeta je ta, koju trebamo za naš uspjeh.

Zahvaljujemo se svima, koji su doprinijeli izradi i koji će doprinijeti provedbi ove Agende 21.

U Bosanskoj Krupi, maja 2005

Prof. Dr. Timi Ećimović
Samostalni naučnik

Ing. Hamdija Grošić
Načelnik općine

2.

Agenda 21 for “Eko riba Krusnica”

Agenda 21 for Eko riba Krusnica is integral part of »Agenda 21 for Sustainable Future of the Area of the Municipality of Bosanska Krupa, Bosnia and Herzegovina« and of documentation for the FAO project GCP/BIH/003/NOR »Support to Income Generation Through Establishment of a Fish Hatchery in Bosnia and Herzegovina«, which is dealing with nature, space and environment protection and development of high sport fishing area as a part of the Eko riba Krusnica activities.

From the nature space and environment protection content, we shall elaborate role of sport fishing, feasibility of restocking of natural waters, “REVIR” project content as an integral part of environmental engineering management of high value nature beauty resort. The goal is general improvement of the nature of River Una Catchments Area, problem solving of negative impact from human population to the nature; sustainable future; mitigation of the impact of the Climate Change System changes; and feasible tourist development of River Krusnica Valley. Majority of mentioned is content of “Local Agenda 21 for Sustainable Future of the Area of



the Municipality of Bosanska Krupa, Bosnia and Herzegovina”, and special part for development of sport fishing on Krusnica River will be presented here.

Sport fishing – we are discussing here only fly fishing, which is a part of sport fishing and fisherman activities. With over 100 years of tradition fly fishing was undergoing transition from rich people activity to activity of demanding sport area. Today popularity of fly fishing is increasing and is becoming more and more recreational activity of common people with respect to the nature, space and environment.

Fly fishing is recreational and sport activity, and both have impact on human population as recreational, sport, economic and social (manufacture, import-export, research and development, employment, social impact, education and training, domestic and international tourism, and local development of the nature beauties, etc.).

Recreational fly fishing is a part of Fishing Associations activities all over the Earth and estimations are in many millions of recreational fly fisherman. Usually the environmental quality is deciding factor for development of fly fishing recreational areas, commonly connected with mountains and Salmon/Trout/Graylings waters.

Late coming Sport Fly Fishing Activity during second half of 20th century is well organized sport activity. It includes national and international organizations. On national level are local, regional (if) and national organizations usually co-ordinated by national Fisherman Association. Also in Bosnia and Herzegovina is National Fisherman Association, with Fly Fishing Section. It was established recently, after Republic Srbska agrees, to join and support national association. Present work of country fly fishing section is connected with Eko riba Krusnica, and initiative for organization of fly fishing competition on the World and European level at River Una and River Pliva (Republic Srbska) is coming from Bosanska Krupa.

World and European sport fly fishing activities are co-ordinated by FIPS-Mouche Association under leadership of James Ferguson from Scotland and Secretary Mario Podmanik from Slovakia. The competitions are regulated by strict rules for organization, sport fly fishing and judging. During 2004 European Championship (EC) with participation of over 10 countries was in Lapland/Sweden, and World Championship (WC) at Slovakia with participation of 24 countries, in 2005 EC is in Poland and WC is in Lapland/Sweden. We are assisting with Eko riba Krusnica Director Hikmet Harbas and National Association to arrange membership of Bosnia and Herzegovina with FIPS-Mouche and to arrange participation of Bosnia and Herzegovina National Fly Fishing Team at WC in Lapland/Sweden.

Within the catchments area of River Una there are fly fishing special waters at Klokot, Martin Brod, Mala Sanica, and Kulen Vakuf. All of them with slight better situation at Mala Sanica have been damaged with stocking of Rainbow Trout large peaces for under hook purpose of wrongly thinking of “quality”. Mala Sanica after our intervention is improving, and this year practically was recorded non Rainbow Trout catch. Martin Brod and Klokot are totally under impact of Rainbow Trout, and within Martin Brod water all Rainbow trout catch has to be taken. Unfortunately it does not improve situation.

River Krusnica was lucky one because Association of Sport Fisherman “Krusnica” with good management served well as nature, space and environment protector. At present River



Krusnica could be considered as preserved nature beauty, with not great problems. FAO project of hatchery is feasibly well prepared, and will increase possibilities for proper nature waters management not only for River Krusnica, but for all River Una catchments area and larger. A part of this effort is mentioned Agenda 21 for sustainable future of the area of the Municipality of Bosanska Krupa and this Agenda 21 for Eko riba Krusnica.

Important role is having co-operation of research and researchers for this purpose. At present Eko riba Krusnica is co-operating with national and international research community. Together with initiative and assistance from FAO following research projects are taking place:

- DNK research,
- Restocking research – feasibility of restocking,
- Fish migration research,
- Fish count – introduction of innovative technology,

And research team is composed from local and international researchers.

With up to now research co-operation we have been satisfied. Bosnia and Herzegovina Fresh Water Production and Markets Study as initial research presentation was correct and presented specific situation within country 10 years after war.

During July we expect fish count and river status study for Krusnica River to be conducted by researchers from Sarajevo.

Impact to the environment of after Spring of Krusnica River to the end of Eko riba Krusnica site (1600 metres) of the construction of Eko riba Krusnica hatchery will be monitored and assisted by team of experts (recommendation):

- Prof. Dr. Timi Ecimovic, International Consultant for Nature, Space and Environment Protection, who will assist with establishment of team within the Municipality of Bosanska Krupa, and will co-operate as consultant,
- Prof. Dr. Aleksander Ivanc, University of Sarajevo, Faculty of Sciences, contract holder (formally FAO may have contract with Faculty of Sciences for up to 5000 US\$ value for this work) and member of team, and
- Two team members from Bosanska Krupa to be appointed by Prof. Dr. Timi Ecimovic in co-operation with Eko riba Krusnica and Municipality of Bosanska Krupa.

Team will assist Eko riba Krusnica, FAO, and Municipality of Bosanska Krupa with appraisal and mitigation of the construction impact to local environment.

Development of 3000 metres of Krusnica River or fly fishing “Revir” area into special fly fishing water will include following:

- construction of Eko riba Krusnica hatchery for production of fingerlings of Brown Trout, Danube Salmon and Graylings, as source of local fish for restocking of Krusnica River, Una River catchments area and larger,
- Management by Eko riba Krusnica,
- Construction of fisherman trail on left bank of Krusnica River – 3000 metres,



- Right bank of Krusnica River will remain forested and will not be allowed fishing from right bank,
- Boats or in water fishing will not be allowed.
- Construction of four resting/barbecuing spots with barbecue, table and benches,
- Construction of five bungalows 6.5 x 7.0 metres as fisherman/tourist information and management Centre and fisherman night over capacity for 4 x 4 fisherman per night,
- Organization of fishing watchman system,
- Construction of sport and recreation facilities as to be agreed with Eko riba Krusnica,
- Publishing of fishing rules as catch and release system, non-barbed hooks system, fly fishing only, and possibility to take trophy fishes only, and

other conditions according to Fly Fishing Club “Krusnica” proposal and management.

Hatchery itself will have treatment of outgoing waters by constructed wetlands and sanitation ponds. This protection was discussed and agreed with management of Eko riba Krusnica

Agenda 21 of Eko riba Krusnica is not closed document but open and agreeable for new developments, programs and cooperation. Co-ordinator for Agenda 21 of Eko riba Krusnica is Director Mr. Hikmet Harbas.

Both agendas of Eko riba Krusnica and Municipality of Bosabnska Krupa are basic documents, which should assist with achievement of sustainable future of the population and nature, space and environment of the region.

Prepared by:

Prof. Dr. Timi Ecimovic,
in co-operation with staff of Eko riba Krusnica.

3.

The report of Eko riba Krušnica.

GCP/BIH/003/NOR

SUPPORT TO INCOME GENERATION THROUGH ESTABLISHMENT OF A FISH HATCHERY IN BOSNIA AND HERZEGOVINA

Mid – term REPORT

By

**Sports Fishermen’s Association “Krusnica”,
Udruzenje sportskih ribolovaca “Krusnica”,**

Anthology 2 – 2001 - 2014



Bosanska Krupa

31st July 2005



Terms of Agreement

Letter of Agreement between FAO and The Sports Fishermen's Association of Krusnica to support the implementation of the Project GCP/BIH/003/NOR: Support to Income Generation through Establishment of a Fish Hatchery.

Background

The objective of the project is to create jobs and incomes for war invalids in the municipality of Bosanska Krupa through the construction and operation of a fish hatchery to produce local strains of brown trout, grayling and Danube salmon for sale for re-stocking natural waters.

Objective of the Agreement

The objective of the agreement is to document the organizational framework through which the Sports Fishermen's Association of Krusnica will operate the fish farm constructed by the project. The purpose of the agreement is also to provide technical support, guidance and training to Eko-Riba Krusnica and its staff to successfully establish and run the project's fish farm, as well as to monitor and perform evaluation on it.

Duration and Timing

This agreement becomes operational on signing by both parties and will expire on 31 December 2005. By mutual agreement, it may then be renewed for a further period.

Monitoring and Progress Reporting

The Recipient Organization shall submit to Mr. Raimund Jehle, Budget Holder, REUP, FAO, with a copy to Mr. Devin Bartley, Senior Fisheries Officer, FAO FIRI, a mid-term report on project progress by 1 August 2005.

The Recipient Organization shall submit to FAO, Rome, an itemized "statement of expenditures" (certified by the Chief Accountant or similar officer of the RO) to accompany the above mid-term report.

The Recipient Organization shall submit to Mr. Raimund Jehle, Budget Holder, REUP, FAO, with a copy to Mr. Devin Bartley, Senior Fisheries Officer, FAO FIRI, a final report within one month following the end of the period of this agreement on 31 December 2005.

The Recipient Organization shall submit to FAO, Rome, a final audited statement of accounts showing the utilization of funds as determined under this Agreement within one month following the completion of the agreement on 31 December 2005. If the legal status of the Recipient Organization precludes the



provision of audited financial statements, a statement certified as to its correctness by the officer responsible for maintaining them will be provided. In such cases, the Organization shall have the right to review the relevant records.

Activities: The Sports Fishermen's Association of Krusnica will be responsible for the following project activities:

- Ensure that the management of Eko-Riba Krusnica will disburse funds for General Operating Expenses of the fish farm, project vehicle etc. as specified in the Project Document;
- Support Eko-Riba Krusnica to operate the project fish farm in an efficient and business-like manner, in accordance with plans specified in the Project Document and amended by agreement with or decision of FAO.
- Ensure that the management of Eko-Riba Krusnica will maintain an accurate inventory of all equipment purchased for the project. All equipment and supplies so purchased will remain the property of FAO until the end of the project when, subject to FAO and donor satisfaction and agreement, it may be formally handed over to Eko-Riba Krusnica.
- Permit catching, from the waters in which it controls fisheries, of brood stock, fish fry and fingerlings needed to supply the project fish farm, at no charge.
- Manage books and accounts of Eko-Riba Krusnica according to the law of Bosnia and Herzegovina and the requirements of FAO and the donor of project GCP/BIH/003/NOR.
- Support the external auditing of Eko-Riba Krusnica accounts that will be arranged by company management as required by national law.

List of Inputs by the RO: Eight fish farm staff (A Director, a Production Manager and six Workers), including arrangements for payments of all taxes, deductions and benefits required by the law of Bosnia and Herzegovina. The cost of staff will be supported by the Agreement. The fish farm staff will be employed through an existing wholly-owned subsidiary company of the Association, called Eko-Riba Krusnica doo. Employees of this not-for-profit company are all registered war invalids, and any surplus funds generated by the project fish farm will be donated to the Organization of War Invalids of Bosanska Krupa.

Monitoring/Certifying Officer: Chief Technical Advisor (CTA) of the Project, assisted by the National Aquaculture Consultant, shall monitor the proper implementation of the Agreement and certify to the disbursing officer that the terms of the Agreement have been satisfactorily met and that appropriate payments can be made.

Budget:

Anthology 2 – 2001 - 2014



Support to Eko-Riba Krusnica and its staff: US\$40,000

General Operating Expenses: US\$12,000

Total: US\$52,000

1. Introduction

Udruzenje Sportskih Ribolovaca »Krusnica« - USR, »Krusnica«

Sport Fisherman Association »Krusnica«.

Sport Fishermen Association “Krusnica”, USR, has been established in 1945, as non-profit, regional sport fishermen association for implementation of protection of Rivers Una and Krusnica catchments area within the Municipality of Bosanska Krupa. Basis of activities is membership, which was in range of 250 – 300 members before war, and after war during 2004 we had 252 members. Registration was renewed during 1996 after war. We expect to comply with new Freshwater Fishery Law¹ (as all fisherman associations within BIH) in near future.

Our main activity is management of natural resource - waters of Rivers Una and Krusnica catchments area within the Municipality of Bosanska Krupa. Part of the waters we have handled over to our Northern town Otoka, where the local sport fisherman association was established. Within our management are 39 kilometres of River Una and tributaries with River Krusnica and others. We are promoters of the nature protection, sport fishery and tourism when sport and recreation of natural waters are concerned. Also we are providers for sport and recreational fishing licence within waters under our jurisdiction. Our budget is made from income of licence sales, membership fees and big users – hydroelectric power stations contributions for use of waters.

As a part of our management we are restocking natural waters. Due to non-existence of restocking fingerlings of Graylings and Danubian Salmon of local genome origin and Brown Trout fingerlings, which are not from local origin, we have accepted initiative from UN FAO to establish such production here. From 2003 joint implementation is going on. We have established local non-profit company Eko Riba Krusnica, which is involved with implementation of hatchery near the spring of Krusnica River.

Part of our management are tidying of river banks, nature, space and environment protection of river banks and nearby lands, sport and tourist activity, and recreational activities connected with management of the nature resort.

Our annual practice is involvement of our management and membership for providing sport fisherman rules, watchman, garbage collection, bush clearing, restocking with Brown Trout fingerlings, sport fishing education and training, sales of licences, local, national and international co-operation for sport fishing competition, and others activities within the management of River Una catchments area under our jurisdiction. Our activities are in accordance with national law for Freshwater fishery.

As special statement we are confirming that USR “Krusnica” activities are in good order, and we are not in bankruptcy, we are not insolvent, our activity is not failure, we are not

¹ Law on Freshwater Fisheries announced on November 20. 2004. at Official Gazette of the Federation of Bosnia and Herzegovina No. 66/04



experiencing professional misconduct, and we are paying taxes and social contributions regularly. We are not at court due to our activity, and we are not involved in any sort of corruption whatsoever.

Regarding the project of ERK Hatchery for production of fingerlings of Danube Salmon, Grayling and Brown Trout of local genome origin we have experience, management, financial structure, and members needed for implementation. We agree to work with on this project, and we feel safe and able to do nice co-operation for nice project.

USR President is Mr. Niaz Tatarevis and management is democratically organized with Management Board and Assembly.

Undersigned president of USR “Krusnica” Mr. Niaz Tatarevic with my signature I am confirming the truth of above introductory statement.

Niaz Tatarevic, the President

2. The Report

Eko Riba Krusnica (ERK) d.o.o. has been established on 30 May 2003 as agreed with initial team of FAO experts during their first visit. Commencement of the work was on 1st January 2004. Eko Riba Krusnica has been established as d.o.o. (adequate to limited liability company L. l. c. in UK), non-profit, and war invalids organization for production of local genome origin fish of Danube Salmon, Brown Trout and Grayling fingerlings for restocking of natural waters of Krusnica and Una Rivers catchments area, and larger Bosnia and Herzegovina. The purpose of establishment of Eko Riba Krusnica d.o.o. was implementation of FAO GCP/BIH/003/NOR project Support to Income Generation through Establishment of a Fish Hatchery in Bosnia and Herzegovina.

From 1 of January 2004 when Eko Riba Krusnica d.o.o. commenced work Director Mr. Hikmet Harbas and Technical Manager Mr. Dzevad Dzigumovic have been employed. Prior to their appointment they have been selected for the job on Management Board session of Udruzenje Sportskih Ribolovaca “Krusnica” (Sport Fisherman Association “Krusnica”) – USR Bosanska Krupa where they have been elected by voting with result that all members of the management Board have voted for them. For financial services - accountant has been appointed same as is for Udruzenje Sportskih Ribolovaca “Krusnica” - USR Bosanska Krupa, the mother organization of the Eko Riba Krusnica d.o.o.

Eko Riba Krusnica d.o.o. (L. l. c.) is registered Bosnian war invalids organization according to laws and regulations of the country. Present management and selected staff are war invalids with disability from 30 % to 100 %, for instance Mr. Kovacevic Hasan and Mr. Hikmet Harbas are 100 % second group war invalids. Operations are conducted in local currency, and it is an integral part of socio economic life of the Municipality and country. Due to interaction and cooperation with FAO we have become a sort of icon for promotion of FAO and Bosnia and Herzegovina co-operation. We are proud of it, and we hope to continue in coming time with successful results.



We would like to review the activities, interaction and cooperation with FAO and other institutions up to date.

Before establishment of Eko Riba Krusnica or before 30 May 2003 the following was done:

Project document preparation mission from FAO arrived in April 2003 as team of following members: Dr David Edwards, Team Leader/Project Manager/Chief Technical Officer (CTO), Dr. Timi Ecimovic, International Scio Economic and Sport Fisheries Consultant, Mr. Adem Hamzic, National Aquaculture Consultant, Mr. Ismet Pasalic, National Socio Economic Consultant and Ms. Merima Erkocevic, translator. They have met local Bosanska Krupa fisheries experts Mr. Hikmet Harbas (over 20 years of experiences with fisheries affairs, and holder of former Yugoslavia 1990 Champion for Danube Salmon sport fishing, 1997 Champion of BIH for invalid sportsman in sport fishing of white fish, 1999 BIH Champion in sport fishing of white fish, 2000 member of national BIH team for white fish sport fishing and many times was on national team and awards holder of sport fishing trophies), Mr. Dzevad Dzigumovic of similar profile (also BIH national champion in sport fly fishing) and other members of Bosanska Krupa Sports Fisherman Association "Krusnica" as: Mr. Nijaz Tatarevic, the President, and other members of the Management Board, who were very keen on the implementation of proposed project. FAO team together with local project promoters as stated above, succeed in promoting acceptance of the project on local (Municipality of Bosanska Krupa), Cantonal and Bosnia and Herzegovina entity level. Output of the first mission was feasibility of the Project at Krusnica River.

After FAO experts have left Bosanska Krupa and according to agreed co-operation the Sport Fisherman Association "Krusnica" registered Eko Riba Krusnia d.o.o. and appointed first General Manager Mr. Hikmet Harbas.

The next phases of implementation were as follows:

FAO has sent the Project information and Project agreement to the Central Government of Bosnia and Herzegovina during beginning of summer 2003. Due to specific three national composition of the BIH Government, finalization of the initial agreement was delayed. With the lobbying and talks with BIH Government finally the initial agreement was signed.

Due to very late response of the Central Government Ministry of Foreign Affairs on 10 December 2003, the project implementation was delayed. Consequently the Project implementation lost first year.

With analysis of needs and present form of registration, and needs of the Project implementation, first registration of Eko Riba Krusnica was changed to adequate administrative form, what was done on 13 February 2004.

Dr. David Edwards CTO arrived in Bosanska Krupa in February 2004 and carried out his program for implementation. Eko Riba Krusnica in meantime have found the possible location (hatchery site), and prepared documentation and Municipality administration for the site procurement. With arrival of CTO, we learned that the site could not be purchased by the FAO Project funds. In cooperation with Municipality of Bosanska Krupa and Cantonal Government from Bihac were allocated funds (30.000 BAM 1.00 BAM = 0.68 US\$) to Eko Riba Krusnica.



ERK has procured hatchery site worth 56.000 BAM on 19 March 2004. At meeting with CTO Eko Riba Krusnica took responsibility for acquiring necessary permits for implementation of the Project.

Together with Mr. Adem Hamzic, National Aquaculture Consultant, local designer office of Mr. Amir Nefic, Aqua Projekt Co., and according to the instructions, first concept or draft of construction documentation for hatchery was made on 25 February 2004.

On 25 February ERK applied for hatchery site location permit at Municipality of Bosanska Krupa. To get it, it was necessary to have land use change permit from Cantonal Government, which was granted on 23 April 2004. On 26 April location permit was granted. By this action ERK has gained 27.500 BAM of land use change fees.

For education of local Eko Riba Krusnica staff CTO was helpful and education was agreed. During March 2004 six staff of ERK has been on training at Norfish facility, Blagaj in Herzegovina. Training was on Rainbow Trout rearing as theoretic and practical.

In meantime Eko Riba Krusnica has applied and has been granted exception of Municipality taxes totalling to 48.000 BAM. Municipality of Bosanska Krupa has given us this free of charge, and it was clear sign of willingness and approval of the work.

ERK continued with problem solving as finalization of construction documentation, translation into English followed, and it was done in seven days as special action, to comply with time limit. Revision process of the documentation was arranged, agreed and received on 28 of June 2004. We have been very happy with progress, and expectations were high.

Education of three senior staff was organized in Sweden and Finland during April/May 2004. The grayling production technology was experienced theoretically and in practice or demonstration and with participation at work. Technology of grayling production was adopted as learned or obtained from Finland experiences. High technology was obtained.

In June 2004 both international consultants arrived. Also group of experts from FAO arrived, and all together we were working on finalization of hatchery construction documentation for the tender purpose. With good help from Prof. Dr. Grant Ross, International Civil Engineer and Environmental Sciences Consultant the hatchery construction documentation has been improved.

Dr Devin Bartley from FAO - Senior Inland Fisheries Officer helped us with preparing application for funds for development of River Krusnica environment. The application was handled over to Embassy of Canada. It was assistance for possible development and improvement of Krusnica River into high sport fly fishing resort.

During International Una Regatta rafting event on July 2004, ERK has invited representative of the Norwegian Kingdom Embassy in this case Donor, with whom ERK has established nice friendly relationship. The hatchery site was inspected and Mr. Jon Hansen, Counselor, was impressed by nature beauty of Krusnica River and its spring.



The International and National consultants have been very active at interaction and cooperation with local, Cantonal and BIH institutions from Universities to veterinary and other organizations. The contracted cooperation was agreed with Faculty of Natural Sciences from Sarajevo, and held discussions with local Bihac Faculty of Biology.

With Sport Fisheries Consultant's assistance, Eko Riba Krusnica has taken action in June 2004 to obtain concession on river Krusnica spring (500 l/sec) and whole length of the River Krusnica, for development of environment to have possibility for keeping brood stock needed for production, and high sport fly fishing resort.

Because it was first case of such application for concession on river in country (BIH), high cantonal officers including the President of Cantonal Government were consulted. All levels of Government have given support for concession as was applied. Only time for administrative action was requested.

On 21 July tender was published on the basis of the presented study, and tender was closed on 21 August.

On 29 September concession for 500 l/sec of water take off from River Krusnica spring was received. Due to lobbying at Cantonal administration ERK received concession only for spring water.

With assistance of both international consultants the concession was clarified in discussion with the President of Cantonal Government, Concession Panel and relevant institutions, Cantonal officials promised to finalize issuing concession on River Krusnica during December 2004.

Transport of building materials and construction equipment and latter need for hatchery production from Bosanska Krupa to hatchery site by waterway was re-examined. Plan was to use water transport along the Krusnica River. This was considered as ecologically not acceptable and with possible bad impact.

ERK proposed new land access road from local village Vranjska (where was existing local road from regional asphalt road up to village) and with construction of new macadam road from Vranska village down the hill side.

Proposed road was going through low valuable forest. ERK has obtained permission for road construction with assistance from the President of Cantonal Government, administration of Cantonal Government and Bosanska Krupa Municipality.

Cantonal Forest Service was very helpful for realization of new access road. The access road documentation was drafted and permit from Cantonal Forest Service was obtained on 9 July 2004. It was agreed to construct road before the tender announcement for hatchery construction, because of the role of access road for transport of materials and equipment for construction of hatchery.

The funds have been available, and ERK took action for preparation of access road construction documentation.



By 19 July access road construction documentation was ready including geodetic work, and ERK apply for permits. On 9 August construction permit was granted. During this action ERK has been given free of charge needed permits and forest damages payment fees totalling to 36.000 BAM.

On 26 July tender was prepared according to the procurement rules, and was published. Potential constructors have been invited, and tender was closed on 28 of August.

The construction of the access road was awarded to local construction company BC Gradnja. Agreement was signed on 4 October 2004 in Sarajevo at UNDP office, and was signed by Sport Fisheries International Consultant and UNDP representative.

On 11 October in writing the constructor was informed about commencement of the work. Due to climatic conditions not many working days were in October and November. So construction of the access road was slow but persistent. The access road was constructed by December 2004.

During spring after snow and spring rains the contractor resurfaced access road, and now the hatchery site could be reached by all types of transport equipment.

As a part of training program on 14 November seven of staff has gone to Norfish Blagaj facilities for already agreed second phase of training. The spawning season was for Rainbow Trout and training was successful. In practice staffs were working on spawning and they gained valuable experience.

Other activities included following:

Sport fly fishing development of Krusnica River is progressing well with assistance of Sport Fisheries International Consultant. In co-operation with Sport Fisherman Association "Krusnica" we are promoting better understanding of the role of sport fishermen and protection of Krusnica and Una Rivers waters on ecologically sound and viable form, not forgetting the nature, space and environment protection.

Sport Fisheries International Consultant has provided option for cooperation of Bosanska Krupa pupils and their respective schools. ERK feels it is nice way to involve pupils in training and learning of environment protection issues.

Eko Riba Krusnica d.o.o. has been established for implementation of the Project, and is working toward the construction of the hatchery. Within the community of the Bosanska Krupa Municipality, Una Sana Canton and BIH has become as icon for FAO cooperation.

Local authorities at Municipality of Bosanska Krupa and Cantonal Government have been very co-operative and financially have supported the Project. Up till end of reporting time in total from Bosnia and Herzegovina side we have received following assistance or benefits:

BAM

- Eko-Riba Krusnica registration	3.000
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- Hatchery site / land - 30.000 KM assistance and total land value	56.000
- Construction permit - 45.000 KM communal fees and taxes 3.000 KM	48.000
- Transfer of land from agriculture to construction purposes	27.500
- Access road construction permit 5.000 and taxes 1.000	6.000
- Non-payment of the forest damages – access road site	30.000
- Allocation of Krusnica River for management to ERK – app. value	200.000
Totalling to	370.500

1.00 BAM = 0.68 US\$

Access road to hatchery site is in use, and during visit of Jon Hannsen, The Counsellor of the Norwegian Kingdom Embassy from Sarajevo, he was glad to experience driving on the access road, and it was most important achievement, because it was actual success, which is opening of finalization of the project. Access road is one of most important action for implementation of the Project during 2004. With access road ready and operational it is easier to have realistic possibilities for tender bidders, and opening the tender for construction of the hatchery facility.

Eko Riba Krusnica's financial affairs have been managed by experienced accountant. Furthermore, ERK's financial affairs are managed according to laws and regulations of Bosnia and Herzegovina. Due to the cooperation with FAO we are glad to fulfil all necessary aspects in this regard. We are very happy with interaction and cooperation with FAO, and we are proud to be a small part of FAO big family. For us the Project goal is great mission, and we would not mind to put all the efforts to reach it.

Activities of Eko Riba Krusnica for the period from December 2004 to July 2005:

During this period there were two fully employed members of Eko Riba Krusnica and these are as follows:

- Hikmet Harbas, the Director of ERK, and
- Dzevad Dzigumovic, in charge of technical activities of ERK

We have full assistance from Nermin Durakovic, FAO National Admin./Logist.

ERK's first duty in 2005 was to re arrange Project documents to be acceptable and readable from the side of FAO, and future bidders that will be invited for International Tender. It was not that easy to get all of the drawings in the format that is satisfactory to comply with FAO standards. Just by converting drawings from ArCon to AutoCad program, it has been proved hard, because while doing that most of the drawings have been losing some of their parts (lines) so that it was necessary to redrawn plans.

Supervision Reports on construction of Access Road were submitted on 13. 01. 2005 by Mr. Husein Kabiljagic, National Consultant Resident Forestry and Road Engineer. Reports were



submitted directly to FAO Rome Head Quarters. We have to add that concerning time, weather conditions and funds available for construction of access road; we are more than satisfied with the outcome of this action being carried out as a part of the main project. The road itself offers excellent access to the site for construction of hatchery, and it means that transport of material, equipment, and manpower to the site will be much “cheaper” time and money saving.

ERK had a visit of Admin/Finance, and Budget review expert mission (18 - 20 January 2005) to Bosanska Krupa for the project GCP/BIH/003/NOR, "Support to Income Generation through the Establishment of a Fish Hatchery" from Mr. Amir Mehmedagic, FAO Belgrade, position Finance Clerk. Budget review was done, and Mr. Mehmedagic did also help us in setting up proper administrative system compatible with FAO and UNDP standards. Tracking of flow of money, data and all correspondence with FAO or UNDP is much easier.

During spring time the AGENDA 21 for sustainable future of the municipality of Bosanska Krupa, Bosnia and Herzegovina (In accordance with Earth Summit, Rio 1992, and Conference for Sustainable Development, Johannesburg, 2002, presenting possibility for Sustainable Future of people living within Bosanska Krupa Municipality area) was launched by initiative from ERK, The Municipality of Bosanska Krupa and assistance of Dr. Timi Ecimovic.

Agenda 21 is program of activity of citizens in certain area that wish to live tomorrow in accordance with realistic potentials of nature, space and environment as well as political, economic and social reality. As such, Agenda 21 for the area of Bosanska Krupa is rising on ruins of 10 years after the war, and was finished with the purpose to make achievable permanent sustainable future in the third millennium of our epoch. Municipality of Bosanska Krupa experienced the cataclysm of destruction during last war. All contents of life of inhabitants were destroyed. After achievement of the peace, inhabitants of Bosanska Krupa were in situation or necessity to establish all basic and other matters of importance for survival, starting from the roof over their heads, food and water, clothing, shoes, medical help and all other requirements of civilization and all that... on ruins. Later on, the primary reconstruction has made life possible, but only on basic level. Today, so many years (10) since war was over, citizens of Bosanska Krupa Municipality are still facing difficulties to organize their lives. Contents of life are far behind the world standards and in order to have better future it is indispensable to organize it better, and to ensure completing of tasks that would be undertaken. It is a challenge to Bosanska Krupa citizens, and all that is included in the plan for better future.

With publishing of the Agenda 21 for Bosanska Krupa municipality, the intention was to illuminate problems of present and future, to define basics of the life tomorrow, to establish contents of necessary projects in present times of big changes on the Earth.

Climate change system impact and protection of nature, space and environment are subjects requiring new solutions. A part of Agenda 21 concerning the nature of Bosanska Krupa area, River Una as main content of the nature beauty, according to words of Dr. Nijaz Abadzic², is one, the only one, and unic, which makes all people living in vicinity particularly obliged concerning that matter. It is possible to explain it as reciprocal dependence of living conditions and quality of nature. We could expect better tomorrow, if that balance between life and

² Dr. Niaz Adabzic is top leading environmentalist in Bosnia and Herzegovina.



nature remains, so to make life feasible that condition demands great effort for its planning stage and execution as well. Agenda 21 for sustainable future in the area of the Municipality of Bosanska Krupa is a document not characterised with perfection, but an open document complementing itself and adapting to new conditions.

After this short introduction to basic concept of Agenda 21, we have to state that Dr. Timi Ecimovic have done enormous job (using his free time). Mr. Ecimovic being a part of the project as the consultant, have used Eko Riba Krusnica Project as a reference, because it is clearly seen that Project GCP/BIH/003/NOR is recognized in Una Sana Canton and Bosanska Krupa in particular as a positive example of possibilities for development in the area, and at the same time preservation of nature resources. Also full support from USR and ERK was delivered in cases needed; e.g. photos, written materials, data of importance etc. As a conclusion we can say that USR and ERK had one of major roles in preparation of Agenda 21. Agenda 21 is printed in Bosnian (150 copies) and in English (150 copies), as well as CD's with both languages on 100 units.

Revision of Project Documents and drawings by Mr. Smail Nuhic was completed on 15. 03. 2005. As already mentioned at the beginning of reporting, original documents and drawings done by Mr. Amir Nefic were not good enough to be easily readable from the side of those who will have to deal with them. We were fully included in providing Mr. Nuhic with all requested information, many times spending lot of hours at his office in Bihac.

Revision of Project Documents and drawings by Mr. Marko Lipovac was done in March 2005. After submission of construction documents to FAO Rome, was seen that documents and drawings are not 100% satisfying, and that is why Mr. M. Lipovac was hired to do revision of them. All this was done with full support from Eko Riba Krusnica team, providing all necessary data for completion of this task. Even though ERK is far away from Rome, at the times we have spent a lot of hours on the phone and contacts through e-mail, so that we felt being a part of it and also distance was no boundary to us to be in every moment available and fully supportive.

During May 2005 Grant Application to the EC for project "Tidying River Banks : Preservation of River Krusnica and Eco Tourism Center" was prepared. Description of the project was sustainable development of River Krusnica as tourist, recreation and sport fishing resort, and protection of nature, space and environment.

Summary: Tidying River Banks: Preservation of River Krusnica and Eco Tourism Centre is project of experienced non-profit Sport Fisherman Association "Krusnica", Bosanska Krupa with aim to have sustainable development of River Krusnica, as path for local area sustainable development towards integration processes to join EU. As employment opportunity targeted group are unemployed people from Bosanska Krupa (with realisation of this project there is place for 8 staff including both gender).

1. One person working at office
2. Fly Fishing Instructor
3. 4 persons working on the protection of fish (Fisheries Watchman)
4. One tourist guide
5. One person for maintenance

Users are citizens of Bosanska Krupa and domestic and international tourist and recreational



people. The main activities will include: catch and release fly fishing, recreation, improvement of local nature beauty as protected tourist site, fisherman trail, preservation of rear species of plants and animals (Human Fish – *Proteus Sanguinus*), and possible development of protected area under international standards.

Objectives of the »Tidying River banks: Preservation of River Krusnica and Eco tourism Centre« project of the USR »Krusnica» are as follows:

1. Sustainable development of the nature beauty and tourist resort of River Krusnica and valley as path for local area of the Municipality of Bosanska Krupa contribution towards integration processes to join EU,
2. Sustainable development of River Krusnica valley as sport and recreation facility for Bosanska Krupa citizens, local and international tourist, and income generating for local people,
3. Sustainable development of River Krusnica valley as path for nature, space and environment protection,
4. Sustainable development of River Krusnica valley as mitigation of impacts from the climate change system.

USR "Krusnica" is holder of this grant application form (because it has set in rules and regulations, which are needed for that - only Non-Profitable organizations can apply) and the Municipality Bosanska Krupa as second partner. Eko Riba Krusnica being part (company that is registered by USR "Krusnica") of it as associate, and have done all works on completion of application form. Getting of these funds will mean to close circle of investments of ERK and its activities. Application was submitted as our own decision, unfortunately we did not received approval, but with corrections what we have done USR and ERK will take another chance and apply again.

During end of May 2005 Dr. Mikael and Mr. Magnus Carlstein visited USR and ERK as Grayling specialist and friends of us from Sweden, and they stayed in Bosanska Krupa till 26th May 2005.

Dr. Mikael Carlstein one of the world best recognized specialist in hatching of Grayling, and also person that we consider as a true friend of Eko Riba Krusnica (it has been proved during education and training of the three members of ERK in Sweden and Finland during April and May 2004), where he unselfishly shared his enormous knowledge about Grayling. During his private visit to Bosanska Krupa, we have used time to introduce to him the nature capacities, to strengthen our relationship, and to make new contacts and plans for possible future cooperation. At the meeting in Sarajevo with the dean of University of Sarajevo Faculty of Science was agreed to work on research of fish count on rivers Una and Krusnica (Mr. Carlstein with team of Faculty of Science).

Other meeting being held at the University of Sarajevo Faculty of Veterinary Medicine where Mr. Carlstein was introduced with the undergoing tests of DNA for analysis of Danube Salmon



(*Hucho Hucho*), Grayling (*Thymallus Thymallus*), and Brown trout (*Salmo trutta fario*). So far Eko Riba Krusnica have provided following:

- 40 fin samples of *Hucho Hucho*
- 60 fin samples of *Thymallus Thymallus*
- 45 fin samples of *Salmo trutta fario*

All this is done to get local genome origin real genetic pattern certificate of these species of fish and to prove that juvenile fish that will be produced at Eko Riba Krusnica hatchery can be used for restocking of all rivers within the Danube Basin. In meantime talks were held with Institutes for DNA analysis of Croatia and Slovenia, so we do hope that they are going to co-operate.

Together with Dr. Timi Ecimovic we worked on possibilities for establishment of Fly Fishing Club in Bosanska Krupa and as a part of Eko Riba Krusnica. Fly Fishing Club would have also Fly Fishing School.

Beside of ordinary fly fishing ERK is also planning to follow new trend and to have fishing activity on catch and release basis, which are those days recognized as demanding high sport and tourist activity. It will allow establishment of Fly Fishing International Club and will increase income generation. One of the goals of USR "Krusnica" with support of Eko Riba Krusnica is to organize and facilitate European Championship in year 2007 and World Championship in 2008 in Fly Fishing. USR and ERK are already on the way to implement above mentioned Championships, and it has been written approval and strong support from: Una Sana Cantonal Government, Municipality Bosanska Krupa, Sports Fisherman's Association of Bosnia and Herzegovina and Sports Fisherman's Association of Una Sana Canton.

Also application for use of municipal waters is submitted to the Ministry of Aquaculture, Agriculture and Forestry and (also this time USR "Krusnica" is the first one to submit it, among all other Sports Fisherman's Associations from Una Sana Canton).

Eko Riba Krusnica is working in close co-operation with Sports Fishermen Association "Krusnica", because Eko Riba Krusnica is owned by USR Krusnica. To explain this we have to say that Eko Riba Krusnica is established as a new child of Sports Fisherman Organization "Krusnica" (parent), and its establishment was as need for implementation of the project GCP/BIH/003/NOR, Establishment of Fish Hatchery on the River Krusnica.

Following the law of Bosnia and Herzegovina each of employees that are registered as employee the employer has to pay: On any total amount of remuneration ERK has to pay 73% extra (using remuneration as a basis for calculation) for social contribution and also each employees is entitled to 200 BAM per month as food supplement for the month.

For example: if salary is 1,000 BAM than ERK has to additional pay the following:

- To pay 1,000 BAM to the employee,
- To pay another 730 BAM to the state as social participation, and
- To pay 200 BAM for the food supplement per month.



Out of this that is listed above, you can see that on Net salary of 1,000 BAM, ERK has to pay another 930 BAM, and it makes the total of 1,930 Gross BAM per month. By this example we would like to explain why costs of salaries for Mr. Harbas and Mr. Dzigumovic are higher than expected.

At the moment the team of these two men is accompanied by Mr. Nermin Durakovic FAO National Administration Logist, and he is employed through the contract with UNDP Office in Sarajevo.

20. 06. 2005 we had visit of Prof. Hamid Custovic who helped us to do review of environmental impact. Excellent expert in the field of preservation of natural environment, where he visited location for construction of Eko Riba Krusnica hatchery and confirmed the greatest concern that hatchery is not dangerous for nature of River Krusica valley and that whole project can be implemented without endangering flora and fauna of the resort.

Beside all above mentioned, ERK also has activities on translations of various hand books on raising of Grayling (English to Bosnian) that will be really useful for future production of Grayling juvenile fish.

Also lot of regular work was carried out on day to day basis to keep the office functional and prepared in all matters with aim to have Eko Riba Krusnica hatchery in as soon as possible ready for production.

The financial report on expenditure of 52.00 US\$ please see separate report.

3. Conclusions

We are very much grateful to FAO for choosing our municipality as for the implementation of the hatchery project.

Of course we have many problems due to language barriers, but we hope to have been successful, and of course with well-known tolerance of English speaking people towards others, we hope to be all right.

Professionally fishery, the nature protection and environmental consciousness have been well known to us and our practice is to care for above mentioned issues.

Of course we are open for knowledge and implementations of new techniques and technologies, and we are grateful for it to FAO, and others, who are assisting our development.

It is our pleasure to be in co-operation with FAO, the donor - the Kingdom of Norway and their Embassy in Sarajevo, and the number of international and national consultants, whom we understand as people of good will.

We would be more than happy to report – hatchery has been constructed, and we hope to be able to do it by our report in December 2005.



4.

GCP/BIH/003/NOR

**SUPPORT TO INCOME GENERATION THROUGH ESTABLISHMENT OF A FISH
HATCHERY IN BOSNIA AND HERZEGOVINA**

**SUMMARY REPORT
SPORT FISHERIES CONSULTANCY**

By

**Prof. Dr. Timi Ecimovic
Sport Fisheries Consultant**

Of

Food and Agriculture Organization of United Nations

Medosi, Korte, 25th July 2005

Anthology 2 – 2001 - 2014



Terms of Reference

International Sport Fisheries Adviser

GCP/BIH/003/NOR

Under the overall supervision of the Regional Representative for Europe and the technical supervision of the Chief Inland Water Resources and Aquaculture Services, FIRI, and direct supervision of the Chief Technical Adviser, the consultant will:

- Advise on measures necessary to advance the sport fishery activities of Krusnica River and nearby waters to bring them up to international standards;
- Advice on regulations to be used for sport fisheries in the area, including policing, pricing and management systems;
- Advice on integral water management and environmental issues as they relate to sport fisheries;
- Prepare final report of activities related to sport fisheries for duration of the project; and
- Undertake other relevant duties upon request from the Regional Representative for Europe and Chief Technical Adviser.

Reporting: The Consultant will produce a final mission report detailing task undertaken, conclusions and recommendations, which will be presented at FAO Headquarters in Rome.

Qualifications: The Consultant will be a science graduate with experience in developing successful sport fisheries.

Duty station: Bosanska Krupa, Bosnia and Herzegovina.

Duration: Two weeks in Bosanska Krupa, plus five days report writing at home- station.

Travelling: by private car from home station.



1. Report

1.1. Content:

1.1.1. Bosnia and Herzegovina

1.1.2. Una Sana Canton

1.1.3. The Municipality of Bosanska Krupa

1.1.4. Sport Fisherman Association “Krusnica”, Bosanska Krupa

1.1.5. Eko Riba Krusnica

1.1.6. River Krusnica

1.1.7. River Krusnica – present sport fishing

1.1.8. River Krusnica – Sport Fishing perspectives

1.1.9. River Krusnica – Sport Fishing Facilities

1.1.10. River Krusnica – measures to advance sport fisheries

1.1.11. River Krusnica – regulations for sport fisheries

1.1.12. River Krusnica – integral water management and nature, space and environment protection

1.1.13. The Programme of Sport Fisheries Advance Development

1.1.14. The Recommendations



1.1.15. The Conclusions

Terminology/dictionary:

Brown Trout – *Salmo trutta m. fario* (Linnaeus 1758)

Grayling – *Thymallus thymallus* (Linnaeus 1758)

Danube Salmon – *Hucho hucho* (Linnaeus 1758)

Rainbow Trout – *Salmo gairdneri irideus* (Gibbons 1855)³

White fish – commonly in use term for fishes of Ciprinidae family we are mentioning important species for Una/Krusnica Rivers as follows:

Chub, Klen – *Leuciscus cephalus* (Linnaeus 1758);

Chub, Klenic – *Leuciscus leuciscus* (Linnaeus 1758);

Danuibe Roach, Plotica – *Rutilus pigus virgo* (Heckel 1852) very common in Una /Krusnica;

Common Nase, Podust – Skobalj – *Chondrostoma nasus* (Linnaeus 1758) very common in Una/Krusnica;

Barbel, Mrena – *Barbus barbus* (Linnaeus 1758);

Pike Fish, Stuka – Pike fish - *Esox lucius* (Linnaeus 1758);

Fly fishing – sport fly fishing with artificial fly for fishing Trout, Salmons and Grayling;⁴

Sustainable future – harmony between human population and the Nature;

The nature, space and environment protection – protection of the Nature;

Integrated water management – managing of water – nature resource in harmony with the Nature;

Agenda 21 – process for sustainable (development) future of the civilization;

Eco-remediation – co-natural techniques/technologies for land, water and air pollution treatment;

FIPS-Mouche – international sport fly fishing association.

³ Rainbow Trout old clasification.

⁴ Also possible fresh water fishing (Pike fish and other predator species) and sea/ocean water fishing with arteficial fly.



1.1.1. Bosnia and Herzegovina

Bosnia and Herzegovina as newly emerged country from former Yugoslavia (1992) has been war zone from 1992 till 1995. From 1995 onward has been divided into two separate entities: Federation of Bosnia and Herzegovina, and Republic of Srpska. Joint body for governing is Joint Presidency and Parliament. At present there are different laws and constitutions for both. Joint laws are those of mutual importance, or enforced by International Community, who is assisting in governing of the country. Recently there is progress with acceptance of needed laws for both entities, due to recognition of needs for international involvements of both entities.

Bosnia and Herzegovina (BIH) is located in the South-Eastern Europe on Balkan Peninsula. In total Bosnia and Herzegovina has area of the country of 51209.2 km² (Statistical data www.fys.ba/BihB/opcistatpodaciobih), out of which land area is 51.197 km², and area of the Adriatic Sea is 12.2 km².

The total length of the land boundaries is 1459 km. Neighbouring countries are Croatia (932 km of border) to the North-West, and South, and Serbia and Montenegro (527 km of border) to the East.

Major rivers and lakes according to geographical data are in more as one country, or are bordering environments. The waters of B&H have two general directions northward to Sava River, which flows to Danube River near Belgrade the capitol of Serbia and Montenegro Republic, and southward to Adriatic Sea.

Southward waters have more endemic fish species due to close environment and close distance of sea waters. Majority of rivers have origin of karst underground waters and strong springs. With development of hydroelectric power stations river environments have been changed due to reservoirs, dams and consequent environmental changes. The biota due to new conditions has been changing, and new fish species have been introduced.

River Una, and North-West part of country Una Sana Canton are marked with natural beauty of Una River. The region is bordering Canton with Republic of Croatia. River Una is tributary to Sava River and together they are a part of Danube River Basin.

1.1.2. Una Sana Canton

Una Sana Canton is one of cantonal regions within Bosnia and Herzegovina and is placed within North-Western part of the country. The capitol of Canton is Bihac and cantonal government includes all institutions of democratic system from central government to parliament. The Canton is divided into 8 municipalities, and one of them is the Municipality of Bosanska Krupa. Major content of the nature within canton is River Una catchments area. It is the nature beauty with spring in Republic of Croatia.

After short run in Croatia it enters Bosnia and Herzegovina and flows through North-Western part till ending into River Sava. River Una has many tributaries and within the Municipality of Bosanska Krupa it receives from right side River Krusnica. General direction of River Una flow is from South towards North. The environment includes high mountains and basic characteristic is karst foundation of the region. Sport fishing has been traditional activity of the people, and it has long tradition of sport fishing and nature/environment protection within region.



As only real value the population is as follows:

The Municipality	No. of citizens
Bihac	60.810
Bosanska Krupa	29.654
Bosanski Petrovac	8.106
Buzim	18.382
Cazin	61,385
Kljuc	16.008
Sanski Most	53.364
Velika Kladusa	50.153
Total the Canton	297.862

Many non-governmental organizations – NGO are active in the field of nature protection, with Una Emeralds from Bihac as leading NGO for environmental protection of River Una. In Bosanska Krupa “Greens” are most popular.

1.1.3. The Municipality of Bosanska Krupa

Bosanska Krupa area is situated within rivers Una and Krusnica. The largest part of town was settled in lowest part between Hum hill and Stari Grad castle on height of 156 meters of enlarged part of Una River Valley. Otoka, second centre inside the municipality area has been established little bit on North downstream the River Una.

Bosanska Krupa Municipality before the war was occupying 778 square kilometres, but during the war, after secession of Buzim local community and Krupa on Una (Serbs new municipality), present Bosanska Krupa Municipality has 556 square kilometres.

Bosanska Krupa Municipality is placed on North - West of Bosnia and Herzegovina, bordering with communities of: Bihac, Cazin, Buzim, Bosanski Petrovac, Sanski Most, Bosanski Novi, Krupa on Una, and Dvor in Republic of Croatia. International River Una, with her spring in Croatia, shortly after her spring is running through Bosnia and Herzegovina's North-West part, actually is making main characteristic of Una-Sana Canton. Bosanska Krupa town is connected inside canton trough roads on south with Bihac and further to Republic of Croatia and with other important communications in Balkan, South Europe, and other parts of Europe.

CLIMAT CHARACTERISTICS

In Bosanska Krupa region is prevailing continental climate with high temperatures during summer months and average year temperature is 10.8 °C. There is very rapid transition of temperatures between winter and spring (month March 5.6 °C, month April 11.1 °C). The autumn is a season with large quantity of rainfall, and spring season as well, so that represent humid parts of year and together have average quantity of 723 mm per square metre of rainfalls. Rains falling during spring and autumn season are long lasting, slow and abundant, causing floods usually.



Snow period is lasting as in an average 127 days per year. Bosanska Krupa has very high percentage of relative and absolute air humidity.

River Una valley/canyon is making directions of local and regional winds and approximate index shows that winds are coming from:

South-West quadrant 13.8%

North-West quadrant 22.90%

Storm winds have never been experienced, and the strongest winds are occurring during February.

With impact of the climate change system the climate will move towards warmer climate and with all characteristics as follows:

IMPACT OF THE CLIMATE CHANGE SYSTEM

In the area of Bosanska Krupa and wider, system of the climate changes could cause following changes:

- Precipitation will change pattern and more water/snow/hail will fall within time frame of event. The new technique for hail protection (joint hail/frost protection with atomizers and nets) in agriculture should be introduced.
- Frequency and impact of earthquakes will increase – it will be necessary to construct counter earthquake constructions/buildings.
- Floods events will be more frequent and out of regular seasons. The impact will be more destructive with higher quantity of water. All area at endangered location would have protection with rock walls or similar to prevent soil erosion during floods. It is necessary to examine settlements and towns related to high floods and to undertake some preventive measures.
- Drought could affect whole biota of the Municipality area. It is necessary to increase quantity of bio-contents on farm-lands and green areas. Together with water retainers/accumulation for fire prevention and irrigation will make possible use of treated water for irrigation.
- Fires in nature will be more frequent (fire protection by storing treated water at suitable locations within township, rural areas and forest should be introduced),
- Erosion, desertification, and loss of fertility are common results from impact of the climate change system.
- Increase of average mean temperature is resulting with loss of fertility and consequent changes within biota. It is necessary to increase bio-content of farm-lands and follow up production in order to intervene for protection.
- Position of the agriculture lands above sea level - will affect their fertility. With impact of the climate change system higher situated lands will have more fertility.



- Occurrence of stronger winds and even hurricanes will become part of lives. All contents of life in human ecology sphere should be checked in order to prevent hard consequences of stronger winds on present building standards and life-style.

- Generally to have short summary of the impact of the climate change system, we may say that the climate is moving northward 100 km per year and moving in height 100 m per year talking of Northern hemisphere.

The climate change system impact will affect human population with higher mean temperatures and consequent health problems. More impact could be on urban population and less on rural.

Due to radical changes in climate conditions it is expected to have changes in biota - plants and animals. It may affect people health, when talking allergic reactions and consequences.

Also aquatic environments will be affected by impact of the climate change system. Mayor impact due to mean temperature increase will be seen as upstream movements of different fish species.

Impact of the climate change system on sport fishing as long term effect will have disastrous result. Within coming decades we shall have to monitor impacts and adjust to new evolvments.

Most important is mentioned mean temperature, which affects local environment biota, fish and other aquatic life representatives. The monitoring is needed to allow permanent follow up of changes.

Due to synergy effect of the climate change system and pollution from human eco system results could be different as expected.

Most susceptible creatures are representatives of crabs - Crustacea family and shells – Lamellibranchia or Bivalvia family, and any change in population of them is affecting whole biota of local waters.

One or more small changes in biota of the local water could cause large effects on local water biota.

Any change within biota of local water is important and usually it affects sport fishing quality. Common effect is extinction of certain fish species, and if it is important sport fishing species it is very bad long term effect.

Restocking with fingerlings of sport fishing important species or local important species as Danube Salmon (*Hucho hucho*), Brown Trout (*Salmo trutta fario*) and Grayling (*Thymallus thymallus*) for Una River catchments area are important activity.

It is important to have facility for production of fingerlings for restocking, because in case of emergency the time factor is important.

In conclusion it is important not to deal with local water only, and with one side effect like the climate change system or pollution effect etc., but to bear in mind complex situation and multiple effects of small changes within very complex system.

DEMOGRAPHIC DATA

**Population in local communities (MZ) in 2004:**

Nb.	Local Community	Number of inhabitants
1	Mahmic selo	2067
2	Jezerski	3505
3	Pistaline	1523
4	Otoka-centar	3080
5	Otoka II	2552
6	Hodzinac	830
7	Krupa II	4320
8	Krupa-centar	4961
9	Zalug	1521
10	Halkici	587
11	Stari grad	1740
12	Zalin	178
13	Arapusa	197
14	Veliki Dubovik	102
15	Jasenica	201
16	Veliki Badic	1691
17	Ostruznica	1203
18	Ljusina	997
19	Ivanjska	454
20	Radic	395
21	Suvaja	251
22	Gornji Petrovici	198
23	Vranjska	222
TOTAL		32753⁵

Population by age in year 2004 was:

⁵ 32.753 is higher figure as stated at The Canton population figure, due to changes in incoming Serbs into the Municipality of Bosanska Krupa.



Age Structure	-18 years		18-35		35-65		Over 65	
		%		%		%		%
	12281	38	8188	25	9015	27	3310	10

Analysing present situation we got number of population density of 58 inhabitants per square kilometre. The municipality have characteristic migrations of population on daily and weekly bases as well as population involved in temporary employment working out of country. According to year 1981 data from the area were 2.993 or 5.4% of total population where temporary employed out of country. We estimate present situation different with larger percentage in exile (exact number is not known).

Population of Bosanska Krupa Municipality is as follows:

	1990	1995	1996	1997	1998	1999
Born	1035	15	250	358	297	92
Deceased	406	95	90	100	100	15
Growth increase	629	-80	160	258	197	77
Deceased babies	17	-	-	1	1	-

Negative growth occurred in 1995 because of many children were born in Cantonal hospital in Bihac. For the fact that it was the year when many citizens returned home to Bosanska Krupa, and town was without conditions for medical care - Health Centre (Dom Zdravlja) Bosanska Krupa and for delivery of babies. Also at present many births are taking place at Cantonal hospital in Bihac.

In the area of Bosanska Krupa are registered 268 war invalids with over 50 % of disability.

According to records of Sahid organization total number of self-supporting mothers is 267.

WATER RESOURCES

Rivers Una and Krusnica both the nature beauties are most important water/aquatic environment. Important to Bosanska Krupa are characteristic springs of water on the contact of limestone layers, which makes different intensity water springs.



River Una flow, within the area of Bosanska Krupa is widening and causing very intense lateral erosion and consequently is forming stratum deposits. Also from right side is receiving waters of River Krusnica.

Peak water level is with intensity of 5 meter of relative elevation which causes floods with longer or shorter intervals.

Average monthly water level on Una is 1.84 m and mean annual is 1.15 m.

In Bosanska Krupa area, or its close surrounding are appearing characteristic karst springs. Most important springs are in Valley of Krusnica River. On distance of 5 km from the town is emerging River Krusnica karst spring, which is one of the strongest in Europe. After the spring was constructed hydroelectric power station, which is in function, and is a property of National Power Company (Elektro distribucija) Bihac.

General characteristic for mentioned resources are low utility and good potential for use as per possible development. This potentials are utilized insufficiently (especially waters), extensively (land), and only sporadic (natural values).

The Municipality of Bosanska Krupa is undergoing practical approach for sustainable development in the form of Agenda 21 for Sustainable Future of the area of the Municipality. The area development programs have been prepared as well as the tourism development plan. Together with Agenda 21 it is possible to have more protection from the climate change impact and better possibility for mitigation of it.

1.1.4. The Sport Fisherman Association “Krusnica”, Bosanska Krupa

The sport fishing tradition is connected with Bosanska Krupa for a long time. Background is sport fishing by end of nineteenth century after Austrian took over Bosnia and Herzegovina. In Bosnia and Herzegovina was published fisherman magazine since those times with all sports events reports. Unfortunately after last war the magazine ceased to exist.

After Second World War in 1945 the Sport Fisherman Association “Krusnica” was established as major gathering of fisherman, and guardian of Una/Krusnica waters and environmental issues.

Sport Fisherman Association “Krusnica” USR “Krusnica” has been established in 1945, as non-profit, regional sport fisherman association for implementation of protection of River Una catchments area within the Municipality of Bosanska Krupa. Basis of activities is membership, which was in range of 250 – 300 members before war, and after war during 2004 was at 252 members. Registration was renewed during 1996. The association will comply with new Freshwater Fishery Law (as all fisherman associations within BIH) in near future. It will require pre-registration, but at moment it is as it is.

Main activity is management of natural resource waters of River Una catchments area within the Municipality of Bosanska Krupa. Part of waters was handled over to Northern town Otoka, where the local sport fisherman association was established. Management of USR is covering 39 kilometres of River Una and tributaries with River Krusnica 6.8 km and others. USR is promoter of tourism when sport and recreation of natural waters are concerned. Also it is provider for sport and recreational fishing licence within waters under jurisdiction. The



budget is made from income of licence sales, membership fees and big users – hydroelectric power stations contributions for use of waters.

USR is regularly on annual basis restocking natural waters with Brown Trout. Due to nonexistence of restocking fingerlings of Graylings and Danube Salmon of local species and Brown Trout fingerlings, which are from genetically confirmed local species, USR have accepted initiative from UN FAO to establish such production on Krusnica River waters. From 2003 joint implementation is going on. First was established local non-profit company Eko Riba Krusnica (2003), which is involved with implementation of hatchery near the source of Krusnica River.

Part of USR management are tidying of river banks, nature, space and environment protection of river banks and nearby lands, sport and tourist activity, and recreational activities connected with rivers waters and rivers banks.

Regular practice of USR is involving management and members for providing sport fisherman watchman, garbage collection, bush clearing, restocking with Brown Trout fingerlings, sport fishing training, sales of licences, local, national and international co-operation for sport fishing competition, and others activities within the management of River Una catchments area under jurisdiction. The activities are managed according to national law for freshwater fishing activities.

Address is: Udruzenje sportskih ribolovaca “Krusnica”, Bosanska Krupa, BIH.

USR President is Mr. Niaz Tatarevic and together with management board the association is successfully managed.

Within sport activities USR have been leading association within Bosnia and Herzegovina with following results:

Competition on municipality level: Annual competition of scouts, juniors and seniors.

Competitions on country level:

Participation at national team:

Fly Fishing:

Float - Angling:

International Competition:

Fly Fishing:

Float - Angling:

1.1.5. Eko Riba Krusnica



Eko Riba Krusnica was established in agreement with FAO initial team and USR “Krusnica” as company for implementation of the GCP/BIH/003/NOR hatchery project at River Krusnica.

Eko Riba Krusnica is active and working on issues of management, training, construction of hatchery and sport fishing activities within River Krusnica valley.

In co-operation with Association of Sport Fisherman “Krusnica”, Bosanska Krupa, The Municipality of Bosanska Krupa, and Una – Sana Cantonal Government, Eko Riba Krusnica received financial and in kind assistance (hatchery site and land for access road, concession on River Krusnica - spring water, management and organisation of high fly fishing resort on River Krusnica from spring downward 3000 metres, and entire River Krusnica as per sport fishing, all together totalling to over 300000 KM (Convertible mark – local currency) or 150000 + EURO (1.00 EURO = 2.00 KM).

Eko Riba Krusnica management and staff, FAO, International Consultants, National Consultants and Association of Sport Fisherman “Krusnica” completed up till now the following:

- Establishment, registration, commencement of the activities, and up till now management of Eko Riba Krusnica since end of 2003,
- Idea, Initial Proposal, Feasibility, Documentation, tender and construction of access road,
- Education and training of staff for work at hatchery,
- Idea, Initial Proposal, Feasibility, Documentation and Tender for hatchery construction. Expectation are that the construction will commence by July 2005,
- Applied and received concession for use of River Krusnica spring water,
- Establishment of Fly Fishing Club “Krusnica”,
- Co-operation with scientific and applied research work and local, national and international researchers,
- Agenda 21 for Eko Riba Krusnica as per nature, space and environment protection of River Krusnica,
- Agenda 21 for Sustainable Future of the Area of the Municipality of Bosanska Krupa as per nature, space and environment protection and integral water management as protection of waters of Una River and Krusnica River.

The Project:

The tender has been announced for construction of hatchery. It was proper decision to have access road construction before tender for construction of hatchery site. Now after access road has been constructed, it is possible to reach hatchery site by road. Most important is to begin construction of hatchery in July, and finish construction by October 2005. Importance is due to collection of brood stock of Brown Trout, Grayling and Danube Salmon needed as preparation for coming spawning season (Brown Trout - December 2005, Grayling - March/April, and Danube Salmon - April). Actually it should be in same time beginning of production.

During my work, I was looking for actual status of Una River basin and Krusnica River, and particularly reproduction of Brown Trout, Grayling, and Danube Salmon. The Municipality of Bosanska Krupa waters include up to 30 kilometres of Una River and 6.8 kilometres of Krusnica River. Also a number of small streams are ending into Una River from both sides. I have inspected potential and actual spawning sites. First spawning season of Brown Trout in December 2004 was confirmation of preparatory work. The Brown Trout spawning was observed on Una River and Krusnica River. The Brown Trout of sizes from 50 – 75 – 85 cm have been seen. It is common to have 2 – 3 large female and one large male trout at one spawning site. Also when smaller fish are involved could be more of them together. On Krusnica River I have seen within 50 metres of water 82 Brown Trout at spawning. Short



video film has been made with Brown Trout spawning by Mr. Hikmet Harbas, the director of Eko Riba Krusnica (ERK), and is at the office in Bosanska Krupa. In March and April 2005 spawning seasons for Grayling and Danube Salmon confirmed expectations. Practically, at any suitable site, spawning of Graylings and Danube Salmon has been recorded. Places for their spawning season have been observed at sites accessible for observation. On both Rivers Una and Krusnica spawning of Graylings was observed. Together with fish count in July (hopefully), and research on biota of River Krusnica will conclude and confirm (hopefully) our appraisal of high natural value of rivers biota. From our observations biota is adequate to the status of waters, with reach content of Brown Trout, Danube Salmon and Graylings as well as other fish species, which are natural for waters of River Una and Krusnica.

Grayling habitats at Una River waters of Bosanska Krupa, which were showing signs of population under stress, due to over fishing and non-adequate restocking, with spring spawning season and after looked much better. For total length of River Krusnica – 6.8 kilometres situation is also improving.

In the case of worsening of the situation, it is possible to map spawning sites, and protect them from illegal fishing. At moment fishing watchman and members of Association of Sport Fisherman “Krusnica” (USR) are practising adequate protection. Eko Riba Krusnica will take additional care for protection of the River Krusnica.

Population of Danube Salmon is under high pressure from sport fisherman and illegal fishing. Situation at Bosanska Krupa waters is much better as at other parts of Una River basin, mainly due to good work of fishing controller/watchman and assistance of members of USR fisherman association. One of the issues of Danube Salmon fishing is: fishing is allowed during very long fishing season - from May to January. Together without restriction for number of fish, which could be taken during season, are both affecting Danube Salmon population? In Danube River Basin other countries fishing of Danube Salmon is allowed from 15th October till 15th February. Also numerous clauses are prescribed for individual water according to experiences of local associations. For instance at Vrhnika, town at River Ljubljana spring near Ljubljana, Slovenia, Association of Sport Fisherman when and if 20 Danube Salmon are taken - the water is closed for that year. Restocking of Danube Salmon is taking place, with restocking of mature/large fishes, taken from smaller streams and put into waters under high pressure. Small streams are declared as not fishing or closed waters. I think the development at Bosanska Krupa waters will undergo similar tactics.

Discussing Danube Salmon - during May/June 2005 mission from 26th May till 31st May at River Una waters below Bosanska Krupa, after River Krusnica estuary and below 5 large Danube Salmon from 5 – 12 kilograms have been taken by fisherman. My expectations on population of Danube Salmon were confirmed.

Brown Trout at Bosanska Krupa waters is in good shape. Large trout could be taken from Una River or Krusnica River. Individual fish could have up to 80 cm in size. During spawning season 2004 I have seen exceptional large males and females.

It is unfortunate that fishing statistics are not collected and are not available. One of first task of USR Sport Fisherman Association should be to regulate this part of fisherman activities.

Population of Graylings, Brown Trout, and Danube Salmon at other waters of River Una basin were examined and have different characteristics. In some parts – Klokot River and River Unac at Martin Brod the Rainbow Trout was introduced at open waters, and full impact on the local fish population is there. Grayling population within Korcanica, Sanica and Sana River, and partly at Unac River, Martin Brod is in good shape.



Generally the biota is changing according to the climate change system changes of mean temperature and other climate characteristics. Main changes are seen at white fish population/migration upwards (Chondrostoma nasus one of white fish called species fingerlings have been recorded for the first time during 2004 and 2005).

Regarding new law on Freshwater Fishing published in Official Gazette and available at ERK, FAO activities, Association of Sport Fisherman “Krusniaca” - USR, Eko Riba Krusnica, Fly Fishing Club “Krusnica” and increasing awareness sport fishing rules will be changed as per nature, space and environment protection and nature resort sustainable future. Rules will be more protective to life of fish species and less allowing for taking fish for diet needs. It is a process of which commencement is here and now.

Environment, space and nature protection of Una River basin waters practically do not exist. Main polluters are municipalities and industry along the river, illegal and legal landfills, transport and agriculture with synthetic chemicals. Eco-remediation does not exist, and water treatment as well. The river is practically sewerage for polluted waters of human population living there. With development of master plan for environmental, space and nature protection in form of Agenda 21 for Sustainable Future of the Area of the Municipality of Bosanska Krupa first step was taken.

It is necessary to work in co-operation with University of Sarajevo, Faculty of Natural Sciences, Institute for Ichthyology (Prof. Adem Hamzic, Aquaculture Specialist) the River Krusnica and River Una, the Municipality of Bosanska Krupa waters – fish account and banks/bottom biota analysis, as document required by new law on Freshwater Fishing.

Legal concession for Krusnica River spring water for use of 500 l/s was signed. The waters of Krusnica River and part of Una River at the estuary of Krusnica River have been allocated to Eko Riba Krusnica by USR - Association of Sport Fisherman “Krusnica”, Bosanska Krupa as per use and management.

The access road to the hatchery site has been successfully constructed. It has great impact to the local community of Vranska village on the top of River Krusnica Valley, where the access road commence its downhill part, and also on the people living within Krusnica River Valley. The image of ERK has been increased. We were lucky to award the access road construction to the BC Gradnja Company, which was right company at right time for the job.

1.1.6. River Krusnica⁶

River Krusnica is right tributary to Una River, and represents the nature beauty as river and as River Krusnica Valley in vicinity of Bosanska Krupa, Actually a small part of River Krusnica is within township area, and estuary is composed of both rivers Una and Krusnica waters. Una River one of right channels is ending into Krusnica River and jointly they are making larger Una River Island.

In total length of River Krusnica is 6.8 kilometres. The entire length of Krusnica River is within area of the Municipality of Bosanska Krupa.

The spring as characteristic karst spring is appearing dramatically with large quantity of water. Actually the spring has large underground lake where the waters are accumulating by gravitation from large mountain range of Grmec Mountain.

⁶ Most of data on River Krusnica are from master thesis of N. Ajanovic, Grayling (*Thymallus thymallus*) Hatchery in the Municipality of Bosanska Krupa in northwest Bosnia and Herzegovina: A Sustainable Development Pilot Project, University of Calgary, 1999.



At spring there is constructed stony/concrete small dam and take of for waters for hydroelectric power station with two small turbines, which is producing power and is an integral part of Power Distribution Company from Bihac.

The Krusnica River waters unite after the power station and the flow is undisturbed till ending into Una River after Bosanska Krupa.

Generally the wideness of the Krusnica River is from 10 - 30 metres. Most of the river's depth varies from 50 cm to 1 m, with deepest spots about 2 m.

The river is looking quite and the flow is undisturbed. There are no waterfalls or other forms of disturbances, and generally is not covered with trees/forest. The banks are solid and covered with vegetation.

Elevation at spring is 200 m and at ending into Una River 140 m. Difference in elevation from spring to estuary with 6.8 km of length is 60 m.

The River Krusnica water flow has got constant stability, which is extremely important condition of any successful aquaculture facility. The riverbed is of limestone, and coloured from white to grey.

Two main characteristics of the Krusnica's flow are in short length (6.8 km) and the karst terrain. Stability of flow is one hydrological characteristic of karst, which provides a stable aquatic environment. Consequently biota is very rich and has good biodiversity. Both plants and animals are through year there and their richness is richness of River Krusnica waters.

The habitat found in and around the River Krusnica is a classic riparian zone. Beside the numerous species of fish, the River Krusnica Valley is home to common or coloured Salamander (*Salamandra salamandra*), European swamp tortoises (*Emys orbicularis*), Otter (*Lutra lutra*), garter snake (*Natrix tessellata*) among others.

Chemical and physical characteristics of River Krusnica waters are extremely suitable for fish. Upper reaches provides very good habitat for trout and graylings because the gradient is steep and rapids are numerous. Down part is good for trout and graylings as well as for white fishes from Cyprinidae family. The water is slightly alkaline (pH 7.9) and temperature is around 10°C and quite constant. Dissolved oxygen is quite high 9.4 mg/l and no traces of pollutants were recorded.

The waters have got a large abundance of prey for fish with 929/square centimetre of zoobenthos per unit. Most common are snails and mussels (Mollusca) 30.45 %, shrimps (Gammaridae) 23.91 %, mayflies (Ephemera and Baetidae) 16.66 %, mosquitoes and flies (Diptera) 22.46 %, beetles (Coleoptera) 5.07 %, and worms (Oligochaeta) 1.45 %.

The average quantity of biomass in the River Krusnica was 530 kg per ha, and it may sustain a fish population from 1855 kg to 3710 kg.

Most common fish in River Krusnica is Grayling (*Thymallus thymallus*) 23 %, followed by: Danube Roach (*Rutilus rutilus*) 20 %, Common nase (*Hondrostoma nasus*) 18 %, Brown Trout (*Salmo trutta m. fario*) 11 %, Barbell (*Barbus barbus*) 7 %, Chub (*Leuciscus cephalus* and *Leuciscus leuciscus*) 6 %, Pike fish (*Esox lucius*) 5 %, Danube Salmon (*Hucho hucho*) 4 % and other species 6 %.

As sport fishing river with Danube Salmon, Brown Trout and Graylings the River Krusnica is suitable for development into high sport fishing resort for fly fishing.



1.1.7. River Krusnica – present sport fishing

The River Krusnica has been under management of Sport Fisherman Association “Krusnica” USR⁷ from Bosanska Krupa. With effect of 2005 the USR has given management of River Krusnica to Eko Riba Krusnica - ERK⁸ for development and protection.

Present sport fishing practice was including fly fishing and angling. By local rules from USR the management and protection were executed. The practice was to limit or close waters if needed. Yearly the restocking was practised with Brown Trout fingerling restocking.

Legal sport fishing was allowed for the members of USR and larger sport fisherman from Una Sana Canton. In practice up to 100 fishermen from Bosanska Krupa were angling and up to 10 were practising fly fishing there.

Illegal activities were recorded and worst was fishing by net for Grayling catching.

The statistics have not been recorded and consequently there are no actual records of sport fishing catch.

1.1.8. River Krusnica – Sport Fishing perspectives

By nature characteristics River Krusnica is excellent fresh water river for development of high sport fly fishing resort. Including characteristics of River Krusnica Valley jointly the area is suitable for fresh water fly fishing and recreational/sport activities.

First 3000 metres after spring could be developed for high fly fishing sport resort with fish trail, resting places and organized sport fly fishing. The rest of the River Krusnica should remain as combined sport fishing activity for fly fishing and angling. With development of hatchery the upper part of the Krusnica River may play important role for broad stock natural water keeping, scientific and research activities and sport high fly fishing resort. All together with smart program of nature, space and environment protection it could be executive sample of sustainable (development) future local fresh water management.

The sport fishing rules should be applied according to USR experience (60 years), present Freshwater fishery law⁹, USR freshwater sport fishing rules, FIPS – Mouche international fly fishing rules, and recommendations needed for excellent fly fishing and the nature protection.

Recreation and sport activities

Measures necessary to advance the sport fishery activities at the Krusnica River have been elaborated at following documents:

- Establishment of the Fly Fishing Club “Krusnica” in Bosnian and English,
- Agenda 21 for Eko Riba Krusnica in Bosnian and English, and

⁷ The Sport Fisherman Association »Krusnica« is municipal organization for management and protection of fresh waters within the Municipality of Bosanska Krupa, and local name is Udruzenje sportskih ribolovaca »Krusnica« short USR. They manage approximately 32 kilometres of Una River and Northern part the rest of the municipality water of Una River they have given for management and protection to Northern town (second town at municipality) Otoka.

⁸ Eko Riba Krusnica the company established for FAO hatchery project has local name »Eko riba Krusnica« or short ERK, and is offspring of USR.

⁹ The Law on Freshwater Fishery was announced at The Official Gazette of the Federation of Bosnia and Herzegovina No. 64/04 on November 20. 2004.



- Agenda 21 for Sustainable Future of the Area of the Municipality of Bosanska Krupa in Bosnian and English – see annexes.

My **recommendation** is to support evolvement of the River Krusnica waters into high fly fishing sport resort on “catch and release” basis, with managed fishing trail and facilities needed for proper use of river resort. Secondly upper part of the River Krusnica will be reserved for brood stock keeping in natural conditions. Of course environment of the River Krusnica Valley should have a program for advanced development according to the Eko Riba Krusnica Agenda 21.

Sport Fly Fishing within Una River has got special place within sport fishing in Bosnia and Herzegovina. Actually there are two Sport Fishing Associations – Bosanska Krupa and Otoka within area of Bosanska Krupa Municipality, and one sport fishing association at Bihac, Kljuc, Cazin, Sanski Most, Buzim and Velika Kladusa within Una – Sana Canton.

Also 4 special waters – “revir” locations are there at: Klokot on Klokot River near Bihac, Martin Brod on Unac River, and Kulen Vakuf as part of Bihac waters, and Upper Sanica on Sanica River as part of Kljuc waters. Those are fly fishing special waters with catch of only one fish over 40 cm – Rainbow Trout, 42 cm – Grayling, 50 centimetres Brown Trout, and 70 cm. Danube Salmon. With time the rules will be changed towards more protection of the fish and “catch and release” sport fishing practice.

Actually I expect the practice of sport fishing will be developed towards international rules near to international association for sport fly fishing FIPS-Mouche rules - please see at: <http://www.cips-fips.org/fips-mouche/index.html> ¹⁰

Within Una – Sana Canton and USR – Association of Sport Fisherman “Krusnica” at Municipality of Bosanska Krupa the membership fees policy is as follows:

- Membership fees normal	75 KM
- Membership fees invalids	40 KM
- Membership fees for pupils and youth	20 KM and
- Foreign citizens membership	140 KM

For special waters the price is 42.50 KM.

USR – Association of Sport Fisherman “Krusnica” at Bosanska Krupa has got 252 members and they collect annually up to 16.000 KM from fishing licences fees. Out of it they are spending: 6000 KM for sport-fishing-watch, 4000 KM for secretary work, 3000 KM restocking, 800 KM for petrol, 1250 federal tax, and 500 KM cantonal tax. It is at present, but with new law on Freshwater Sport Fishing they will have to change registration. Major improvement is request for Ltd registration with permanent manager – responsible person.

The activities of ERK – Eko Riba Krusnica as they are, would fit into above mentioned frame.

I had discussion with USR - Association of Sport Fisherman “Krusnica”, Bosanska Krupa and among measures necessary to advance sport fishing activities at Krusnica and Una Rivers we agree to improve sport fishing rules and practice.

On my initiative we agreed to establish Fly Fishing Club “Krusnica”, which should play role of promotion and management of fly fishing and the nature protection at Krusnica River.

¹⁰ Fips – Mouche rules are as attachment.



As possibility for international promotion we discussed and established proposal for organisation (if) of European Championship 2007, and World Championship 2008 in Fly Fishing to FIPS - Mouche. Initial steering committee is under consideration, and members are from Cantonal Government, Municipality of Bosanska Krupa (Cantonal Premier and Mayor of Bosanska Krupa to be honourable presidents), and Presidents of Fisherman Association within Una – Sana Canton to be members, representative of Fisherman Association Sipovo on Pliva River, Republic of Srpska, and representative of federal fisherman association. Together with staff of Eko Riba Krusnica I have prepared initial proposal for formation of Fly Fishing Club “Krusnica” and proposal for European Championship and World Championship in Fly Fishing.

Discussing Una River Basin I think we have to work on environmental quality of Una River Basin. It will be necessary to develop sport fishing and sport fly fishing rules and practice. The rules and practice should follow Law on Freshwater Fishing of B&H; FIPS – Mouche international rules; Nature, space and environment protection rules and practice; Sport fishing practice to support sustainable future of Una and Krusnica waters within the management of USR; Administrative, physical and practical protection of waters, sport fishing and fishermen; Development of entrepreneurship thinking and practice as support to income generation; Fishing and nature protection - Watchman service; and education from children to adults as lifelong education system.

Restocking of natural waters with local fish fingerling produced within area should become practice. Danube Salmon (*Hucho hucho*) is endangered species and special care should be devoted for long range protection. Local Brown Trout (*Salmo trutta fario*) of local genome and production, which is an integral part of present project – ERK should be available. Finally with availability of local fingerling of Grayling (*Thimallus thimallus*) the support for fly fishing interesting species could be closed. Restocking should be done together with monitoring and follow up of results. It has to be done in co-operation with research work. Possibility for applied research work of marking and follow up of restocked fish could prove realistic impact of restocking.

International promotion of sport fishing activities, facilities and environment (nature beauty) with organization of Fly Fishing Club, international, national and local competitions and recreational facilities should contribute toward better use and promotion of Krusnica River Valley as nature beauty and properly managed resort.

People and fisherman education towards “catch and release” and sport fishing should be target of fisherman associations. In co-operation with present schooling system and joint organization of life long education on specific targets as sport fishing and nature, space and environment protection the results could be achieved in due time.

Proper accommodation facilities for international and national visitors within Krusnica River Valley and B&B¹¹ facilities at Bosanska Krupa should be developed. Generally relationship of all users and people living within River Una environment should be directed toward recognition of the natural values.

With implementation of ERK Agenda 21 for Krusnica River Valley, and Agenda 21 for Sustainable Future of the Area of the Municipality of Bosanska Krupa we intend to have a path for evolvement toward the sustainable future of the area.

With successful implementation of Eko Riba Krusnica project, eco-remediation, Agenda 21 and protection of nature, space and environment the Municipality of Bosanska Krupa may take leading role within Bosnia and Herzegovina as model for possible development.

¹¹ Bead and breakfast system for visitors to have needed standard from accomodation, information to friendly environment quality.



1.1.9. River Krusnica - Sport Fishing Facilities

Basis for sport fishing and nature protection of Krusnica River Valley and larger Una River catchments area is development of FAO project for Income generation through establishment of fish hatchery for production of local genome fish species of Brown Trout, Grayling and Danube Salmon.

The project - sport fishing facilities of ERK include 3 kilometres of fish trail, resting places, and accommodation facilities for fishermen. Fish trail will be constructed along left bank of the river and right bank will be reserved for bushes and trees.

3 kilometres of fish trail construction will allow easy access to fly fishing from left bank of initial part of River Krusnica along the hatchery and other facilities of ERK. Due to multi-purpose of this part of river – broad stock keeping, fly fishing and research the fly fishing will be allowed from fish trail only.

Fish trail itself will be constructed from local hard wood in combination with other natural materials available at spot. Resting places will be a part of fish trail and will include barbecue, benches, table under constructed shade and waste deposition place. The wooden panels with multi lingual content will facilitate use of fishing trail.

Other part of facility will be 5 wooden bungalows as management office and accommodation facility.

1.1.10 River Krusnica – measures to advance sport fisheries

Along measures necessary to make River Krusnica an international acceptable fishing spot will be also management and rules, guiding and combination of fishing and recreation. Special care will be given to availability of trophy fish of Brown Trout and Grayling.

Package for visitors will include sport fishing, recreation and nature interesting spots observation including mountain, valley, forest, specific karst forms, caves and underwater diving observation possibilities with photo safari. Human Fish (*Proteus Sanguinus*) and on other rear creature information will be available together with observation possibilities. Second to this it will include also combined package with visit to more facilities. For instance Pliva River, Krusnica River and Plitvice Lakes (Croatia) package etc.

As exclusive special offer it could be organized sport fishing package of Danube Salmon fishing. Due to underwater movie of Danube Salmon population at Una River (movie is available at ERK) there are spots with large population of Danube Salmon. At such spots it could be organized guided Danube Salmon fishing. Such package could be priced as highest possibility.

The main promotion would be quality of the offer and experience of the visitors. Also promotion materials will be prepared in multi lingual form as written, video and computer technique.

The pricing policy will mirror facility quality.

Also in line with possible development The Proposal for Fly Fishing Club “Krusnica” was prepared, approved and established, and is as follows:

Proposal for establishment of Fly Fishing Club “Krusnica” as section of Association of Sport Fisherman “Krusnica” Bosanska Krupa, Bosnia and Herzegovina



Proposal in Bosnian language has been written and submitted to USR - Association of Sport Fisherman "Krusnica" during the end of September 2004. Due to changes – new law on Freshwater Fishing, "Agenda 21 for Sustainable Future of the Area of Bosanska Krupa Municipality" published by end of May 2005, Agenda 21 of Eko Riba Krusnica written by end of May 2005, progress with development of hatchery at River Krusnica – FAO project, and meeting of USR - Sport Fisherman Association "Krusnica" Managing Board in Bosanska Krupa on 26th May 2005, where the proposal was accepted and approved, the following are core issues of establishment of the Fly Fishing Club "Krusnica" for Krusnica River, Eko Riba Kreusnica and Bosanska Krupa.

The proposal is draft and is written in both languages as tool to assist Eko Riba Krusnica to work on Fly Fishing Club "Krusnica" activity.

Within Eko riba Krusnica activities and as integral part of the management, and as section of the Sport Fisherman Association "Krusnica" according to Management Board decision the Fly Fishing Club "Krusnica" has been established. The Director of Eko Riba Krusnica is in same time President of the Club.

The name:

- In English: "Fly Fishing Club "Krusnica", Bosanska Krupa, Bosnia and Herzegovina"
- In Bosnian: "Klub sportskih ribolovaca sa mahacem "Krusnica", Bosanska Krupa, Bosna i Hercegovina"

The sign: the Club has sign, which could be used as needed.

The seal: the Club have seal with sign on.

Address: Eko Riba Krusnica is address of the Club.

This document is based on the documents and work of:

- Activity and establishment of Sport Fishing Association "Krusnica", and their Management Board decision,
- Documents and work of the Municipality of Bosanska Krupa and Una – Sana Canton Government as per protection of Nature, Space and Environment, Development directives for Una River Catchments Area sport fishing activities, nature as unique nature beauty protection and tourism development etc.,
- Freshwater Fishing law of Bosnia and Herzegovina,
- Long term program Agenda 21 for Sustainable Future of the Area of the Municipality of Bosanska Krupa, and
- Agenda 21 for Eko Riba Krusnica and other activities of FAO for establishment of Brown Trout, Danube Salmon and Graylings hatchery for production of fingerlings for restocking of natural waters of Una River Catchments area.

Basic activities of Fly Fishing Club "Krusnica" are as follows:

- Protection and promotion of sport fly fishing and sport fly fisherman,
- Protection and promotion of nature, space and environment protection,



- Protection and promotion of River Krusnica and her upper part (3000 metres after spring as “REVIR”) as especial water for sport fly fishing only,
- Publishing and enforcement of the rules for Sport Fly Fishing activities,
- Publishing and enforcement of the rules for Sport Fly Fishing within Una River part of fishing waters within the Municipality of Bosanska Krupa,
- Publishing and enforcement of adequate fish protection periods with better possibilities for protection of fish population,
- Education of children, youth and other people about sport fishing activities,
- Education of fish watchman,
- Education, election and nomination of sport fly fishing and other fisherman activities judges,
- Preparation, organization and promotion of sport fishing competition,
- Co-operation with similar organizations at Bosnia and Herzegovina and foreign countries,
- Co-operation for Brown Trout, Danube Salmon and Graylings restocking,
- Protection and promotion of artificial bites producers and production for sport fly fishing, education, organization of competitions etc.,
- Education, protection and promotion of sport fishing guides for sport fly fishing,
- Organization and promotion of sport and recreational fly fishing activities on River Krusnica for domestic and foreign participants/members, deciding on price and issuing of day, week, month or year fishing licences for domestic and foreign participants/members,
- Information and experience exchange with other similar organizations in Bosnia and Herzegovina, and
- Management of the Club affairs.

Fly Fishing Club “Krusnica” will have own membership. All members of USR – Association of Sport Fisherman “Krusnica” have got rights to become member of the Club. They have rights to decide on their membership with the Club yearly, during the membership dues payment. From membership dues the USR – Association of Sport Fisherman “Krusnica” will pay 3 % of 25 % from sport competition money to Fly Fishing Club “Krusnica” as assistance for management. Annual fees for membership with the Club are 50.00 KM, and could be adjusted from time to time. With payments of fees, members have got right to exercise sport fly fishing at Krusnica River both “Revir” especial waters 3000 metres after the spring, and part till estuary of River Krusnica into River Una.

The Club may have other members as individual active members, individual members and or both supporting, and could be domestic and foreign. Also companies and institutions, schools, NGO's, domestic and foreign could be supporting members, and fees have to be agreed upon.

Exclusive the Club member card should contain all information needed, and should have image for promotion of the Club.

The Club financial affairs are managed as part of transaction account of Sport Fisherman Association “Krusnica” and are part of their accountancy.

The Club may establish internal working group or panels with goal of solving specific issues. Members could be from the Club or from outside including international community.

The Club is working under laws, regulations and decisions from local, cantonal and Federal Government.

Expectation is to have up to 300 local and national members sport fishermen and up to 50 international within initial two years of activity. The number of supporting members has to be seen.



Close connection of high value freshwater fly fishing resort and protection of Nature are demanding serious standings towards protection of nature, space and environment. Due to UN Sustainable Development program, Earth Summit at Rio 1992, and 10 years after SD summit at Johannesburg, South Africa, Agenda for Change, Millennium Goals etc., I have initiated and assisted preparation of Agenda 21 for Eko Riba Krusnica.

Agenda 21 - as main activity within nature, space and environment protection was elaborated as follows:

Agenda 21 for Eko Riba Krusnica

Agenda 21 for Eko Riba Krusnica is an integral part of »Agenda 21 for Sustainable Future of the Area of the Municipality of Bosanska Krupa, Bosnia and Herzegovina« and of documentation for the FAO project GCP/BIH/003/NOR »Support to Income Generation Through Establishment of a Fish Hatchery in Bosnia and Herzegovina«, which is dealing with nature, space and environment protection and development of high sport fishing area as a part of the Eko Riba Krusnica activities.

From the nature space and environment protection content, we shall elaborate role of sport fishing, feasibility of restocking of natural waters, "REVIR" project content as an integral part of environmental engineering management of high value nature beauty resort. The goal is general improvement of the nature of River Una Catchments Area, problem solving of negative impact from human population to the nature; sustainable (development) future; mitigation of the impact of the Climate Change System changes; and feasible tourist development of River Krusnica Valley. Majority of mentioned is content of "Local Agenda 21 for Sustainable Future of the Area of the Municipality of Bosanska Krupa, Bosnia and Herzegovina", and special part for development of sport fishing on Krusnica River will be presented here.

Sport fishing – we are discussing here only fly fishing and Danube Salmon fishing, which is a part of sport fishing and fisherman activities. With over 100 years of tradition fly fishing was undergoing transition from rich people activity to activity of demanding sport area. Today popularity of fly fishing is increasing and is becoming more and more recreational activity of common people with respect to the nature, space and environment.

Fly fishing is recreational and sport activity, and both have impact on human population as recreational, sport, economic and social (manufacture, import-export, research and development, employment, social impact, education and training, domestic and international tourism, and local development of the nature beauties, etc.).

Recreational fly fishing is a part of Fishing Associations activities all over the Earth and estimations are in many millions of recreational fly fisherman. Usually the environmental quality is deciding factor for development of fly fishing sport and recreational areas, commonly connected with mountains and Salmon/Trout/Graylings waters as freshwaters sport fisherman activities. There are known also sea and oceans fly fishing activities which are evolving nicely.

Late coming Sport Fly Fishing Activity during second half of 20th century is well organized sport activity. It includes national and international organizations. On national level are local, regional (if) and national organizations usually co-ordinated by national Fisherman Association. Also in Bosnia and Herzegovina is National Fisherman Association, with Fly Fishing Section. It was established recently,



after Republic Srpska agrees, to join and support national association. Present work of country fly fishing section is connected with Eko Riba Krusnica, and initiative for organization of fly fishing competition on the World and European level at River Una and River Pliva (Republic Srpska) is coming from Bosanska Krupa.

World and European sport fly fishing activities are co-ordinated by FIPS-Mouche Association under leadership of James Ferguson from Scotland and Secretary Mario Podmanik from Slovakia. The competitions are regulated by strict rules for organization, sport fly fishing and judging. During 2004 European Championship (EFFC) with participation of over 10 countries was in Lapland/Sweden, and World Championship (WFFC) at Slovakia with participation of 24 countries, in 2005 EFFC is in Poland and WFFC is in Lapland/Sweden. We are assisting with Eko Riba Krusnica Director Hikmet Harbas and National Association to arrange membership of Bosnia and Herzegovina with FIPS-Mouche and to arrange participation of Bosnia and Herzegovina National Fly Fishing Team at WFFC in Lapland/Sweden.

Within the catchments area of River Una there are fly fishing special waters at Klokot, Martin Brod, Mala Sanica, and Kulen Vakuf. All of them with slight better situation at Mala Sanica have been damaged with introduction of Rainbow Trout large peaces for under hook purpose of wrongly thinking of "quality". Mala Sanica after our intervention is improving, and this year practically was recorded non Rainbow Trout catch. Martin Brod and Klokot are totally under impact of Rainbow Trout, and within Martin Brod water all Rainbow Trout catch has to be taken. Unfortunately it does not improve situation.

River Krusnica was lucky one because USR - Association of Sport Fisherman "Krusnica" with good management served well as nature, space and environment protector. At present River Krusnica could be considered as preserved nature beauty, with not great problems. FAO project of hatchery is feasibly well prepared, and will increase possibilities for proper nature waters management not only for River Krusnica, but for all River Una catchments area and larger. A part of this effort is mentioned Agenda 21 for Sustainable Future of the Area of the Municipality of Bosanska Krupa and this Agenda 21 for Eko Riba Krusnica.

Important role is to have/organize co-operation of research and researchers for this purpose. At present Eko Riba Krusnica is co-operating with national and international research community. Results of research work should be a part of marketing port-foil for sales of Brown Trout, Danube Salmon and Graylings fingerlings

With up to now research co-operation we have been satisfied. Bosnia and Herzegovina Freshwater Fish Production and Markets Study as initial research presentation was correct and presented specific situation within country 10 years after war.

During July 2005 we expect fish count and river biota status study for Krusnica River to be conducted by researchers from Sarajevo. This is also required by new Law on Freshwater Fishing.

Development of 3000 metres of Krusnica River or fly fishing "Revir" area into special fly fishing water will include following:

- Construction of Eko Riba Krusnica hatchery for production of fingerlings of Brown Trout, Danube Salmon and Graylings, as source of local fish for restocking of Krusnica River, Una River catchments area and larger,
- Management by Eko Riba Krusnica,
- Construction of fisherman trail on left bank of Krusnica River – 3000 metres,



- Right bank of Krusnica River will remain forested and will not be allowed fishing from right bank,
- Only fishing from fish trail will be permitted,
- Package high fishing tourism will be organized, and as peak offer the exclusive Danube Salmon guided package will be available.
- Construction of four resting/barbecuing spots with shade, barbecue, table and benches, waste deposition facility will be integrated at fishing trail.
- Construction of five bungalows 6.5 x 7.0 metres as fisherman/tourist information and management Centre, and with fisherman night over capacity for 4 x 4 fisherman per night,
- Organization of fishing watchman system,
- Construction of sport and recreation facilities as to be agreed with Eko riba Krusnica,
- Publishing of fishing rules as “catch and release” system, non barbed hooks system, fly fishing only, and possibility to take trophy fishes only, and

other conditions according to Fly Fishing Club “Krusnica” proposal and management.

Hatchery itself will have treatment of outgoing waters by constructed wetlands and sanitation ponds. This protection was discussed and agreed with management of Eko Riba Krusnica, Technology is a part of eco-remediation techniques for treatment of polluted land, seas and air environments.

Agenda 21 of Eko Riba Krusnica is not closed document but open and agreeable for new developments, programs and cooperation. Co-ordinator for Agenda 21 of Eko Riba Krusnica is Director Mr. Hikmet Harbas.

Both agendas of Eko Riba Krusnica and Municipality of Bosabnska Krupa are basic documents, which should assist with achievement of sustainable future of the population and nature, space and environment of the region.

1.1.11. River Krusnica – regulations for sport fisheries

Basic regulation for freshwater fisheries is Bosnia and Herzegovina Law on Freshwater Fisheries, which was announced on November 27, 2004 at Official Gazette.

Law on Freshwater Fisheries is adopted as set of regulations for regulation, control, management, promotion and the nature protection. As such it is basic regulation for sport fisheries within Una River catchments area.

Beside administrative, technical and management issues the core point is protection of biota, biodiversity and mitigation of the impact from human population to freshwater biota.

The law require organization of freshwater activities as transparent business activity with personal responsibility of leadership. It is connecting business and the nature resort by putting concession for freshwaters as tool for transfer of the nature resort to business.

The concession as technical process is based upon freshwater business content and advantage is complex business projection. By other words combination of activities including freshwater fisheries and tourism together with nature, space and environment protection could be recommendation for success.



Technical issues of sport fishing are put into the fisherman association hands and scientific/research institutions. Basic requirement is recognition of freshwater resort content and corresponding utilization/management. For this purpose it is required study of resort quality from fish count to the content of all parts of the freshwater resort – bottom biota, banks biota. On the basis of this work the management of the freshwater resort is responsible to work out adequate plan of business activities.

Regulations of sport fishing are in the frame of present ones, with needs for new additions connecting improvement within national and international community. New results from the sport fishing and nature, space and environment protection research and experiences are important and should be included into new regulations.

From international community most important are regulations from international sport fishing associations CIPS and FIPS – Mouche. In our case we have to see possibilities for incorporation of fly fishing international rules (FIPS – Mouche)¹² into practice of fly fishing.

Enforcement of the regulations is legal obligation of government, the business subjects and population connected with freshwater fisheries.

Present scenario of FAO proposed project of fish hatchery and consequent business activities including hatchery, sport fishing, nature, space and environment protection, development of high fly fishing the nature beauty resort, sport and recreation program, management of the freshwater resort River Krusnica, and assistance for long term management of the Una River catchments area with availability of needed local genome fishes of Danube Salmon, Brown Trout and Grayling are proper to feet into present status of freshwater fisheries within Bosnia and Herzegovina as well as into Una Sana Canton and the municipality of Bosanska Krupa.

In case somebody would seek specific advice on freshwater management and environment issues relating to sport fisheries the respond would be as scenario of the Eko Riba Krusnica.

The pricing policy should follow two important trends. First is relation between the quality of the content and pricing policy related to similar or like offers on national level. Second is same but related to international competition. Also it is important to have pricing policy related to local sport fisherman and their financial abilities.

The pricing policy should include levels of the quality of offers and follow their demand and consummation. If ERK could put offer for Danube Salmon exclusive fishing on Una River within the Municipality of Bosanska Krupa as guided tour on highest international sport fishing level – the pricing policy has open possibility for high price. On the other hand the offer is not only Danube Salmon fishing but also adaptation of local people to international visitors, accommodation facility quality, food and beverage quality and fishing guide experience. It is complicated issue but manageable and possible.

Present pricing policy on local level as per Association of Sport Fisherman “Krusnica” is adequate. With new content of offers from ERK and regarding international involvements the pricing policy should be adjusted.

1.1.12 Integral water management and nature, space and environment protection

From the beginning of the FAO project in Bosanska Krupa, and due to high level of environmental consciousness of the citizens of Una Sana Canton, and the Municipality of Bosanska Krupa it was target to develop the Nature protection plan suitable for socio-economic situation of the municipality.

¹² FIPS – Mouche regulation are attached to this Summary report.



During first half of 2005 year in co-operation with large number of intellectuals and common citizens of Bosanska Krupa, together with municipal administration and Lord Mayor we have concluded and published Agenda 21 for Sustainable Future of the Area of the Municipality of Bosanska Krupa in Bosnian and English.

Agenda 21 was accepted and many citizens expressed their gratitude for our team voluntary work. The booklet is at FAO HQ.

1.1.13. The Programme of Sport Fisheries Advance Development

The programme for sport fisheries advance development is ever lasting process of learning, co-operating, making joint actions, adjusting to new research development and development of the local, national and international socio-economic system

In the case of Eko Ribe Krusnica advance development is next phase of co-operation with local population. Connecting fishing as tourism, entrepreneur attitude and making complex offer of hospitality, B&B, good food and beverage, cultural happenings, social gathering and high value fishing, hunting, rafting, canoeing, diving, photo safari, rear observations, etc. is a challenge for further work.

Second complex advance development should be production of artificial fly and other bites. Also part of advanced development should be connecting of Bosanska Krupa with international fishing equipment production and possible co-operation. In any case nice fly fishing spot should have nice fly fishing equipment shop.

1.1.14 and 1.1.15 Recommendations and conclusions

Summary of conclusions and recommendations:

- River Krusnica Valley and river itself is the nature beauty. Luckily it was protected by USR “Krusnica” and citizens of Bosanska Krupa, and at present it may be developed into nice nature, sport and recreation centre with very important activity – Danube Salmon, Brown Trout and Grayling hatchery.
- 3000 metres of Krusnica River from spring downward could be developed as water for Fly Fishing Club “Krusnica”, with good possibilities to become nice national and international centre for sport fly fishing.
- Remaining part of River Krusnica till estuary at River Una – 3800 metres could be developed as part for sport fishing both fly fishing and angling.
- Fly Fishing Club “Krusnica” will maintain high standard of management of the resort. Fly fishing activity includes: fishing trail on left bank - 3000 metres; 4 resting sites with shades, barbecuing facilities, table, benches, and waste deposition facility. Right bank of the River Krusnica will remain forested and will be restricted area or nature habitat,
- ERK management include combined utilisation of freshwater from Krusnica River as: hatchery for Danube Salmon, Brown Trout and Grayling; Fly Fishing Club “Krusnica” water for high fly fishing resort with trophy fish, barb-less hooks and “catch and release” system with or without guides fishing; and broad stock keeping water.
- Sport fly fishing local regulations will be adjusted with FIPS – Mouche fly fishing international organization rules thinking of technical part of fishing.



- At club water - no boats or any sort of floating devices are allowed for use, only research activities may use boat with clear written notice “RESEARCH VESSEL”,
- Trophy fish could be taken when: the length from top of the mouth to end of the tail fin is for Brown Trout 80 + cm, Grayling 50 + cm, and Danube Salmon 110 + cm. Additional charges for trophy fish will be at 1.00 KM for 1 (one) cm of fish body length.
- Fly fishing at Club waters is allowed for fisherman with licence for fly fishing, in the case of fisherman with no licence – local fly fishing guide is required,
- Handling fish catch – should follow FIPS-Mouche rules,
- Waste deposition into waters or on banks are not allowed – waste deposition facilities will be placed at resting sites and along left river bank,
- Information boards with rules and other relevant information should stay at beginning of the Club waters 3000 metres after River Krusnica spring, and at resting places written in Bosnian and English,
- Fly fisherman exercising fly fishing at Club waters should have valid licence,
- Five bungalows for Club Centre and over night stay facilities for 4 x 4 fishermen will be a part of ERK and Club activities. Other sport recreation facilities will be constructed by ERK, and will be a part of recreational possibilities at Club and Upper River Krusnica Valley area.

ERK present employment and planned staff are adequate for the purpose of production and management of the hatchery. Sport fishing activities will require new workers. The salary policy should follow national developments.

Measures necessary to advance the sport fishery activities together with environmental protection of the Una River Basin have been accepted by the Municipality of Bosanska Krupa.

Integral Water Management within the Krusnica River Valley and the Municipality of Bosanska Krupa as a part of environmental protection, and has been integrated within both Agenda 21 of the Municipality and Eko Riba Krusnica.

Fly Fishing Club “Krusnica” is an important part of economic activity and nature, space and environment protection. As recommendation was given at both Fly Fishing Club and Agenda 21 for Eko Riba Krusnica presentations, I would like to point out important follow up of research and development activities.

My final recommendation is - let us continue with assistance to Eko Riba Krusnica and to be a part of nice development of the nature beauty – River Krusnica and Krusnica River Valley.

Annexes:

1. FIPS – Mouche Fishing Rules 2005,
2. B&H Law on Freshwater Fishing in Bosnian.

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Korte/Medosi, april 2005

TRAJNOSTNA PRIHODNOST OKOLJA RIBIŠKE DRUŽINE VRHNIKA

Prof. dr. Timi Ećimović¹³, mag. Nedžad Ajanović¹⁴

¹³ Timi Ećimović, prof. dr. okoljskih ved na Ansted Univerzi (UK), volonterski predstojnik SEG Inštituta za klimatske spremembe, predsednik Svetovnega foruma mislecev, član Evropske akademije znanosti in umetnosti, kapetan Slovenske muharske reprezentane in član RD Vrhnika.



Trajnostna prihodnost (lit. 1,4, 5, 6, 7, 8, 9, 10) okolja ribiške družine Vrhnika je prispevek ob jubileju RD Vrhnika.

Okolje ribiške družine Vrhnika sestavlja vodovje reke Ljubljanice oziroma površina padavinskega zaledja v Republiki Sloveniji (2) in malega dela površine padavinskega zaledja v Republiki Hrvaški – okoliš Prezida, oziroma območje od idrijskega preloma do reke Save ali od Krasa preko Notranjske do Ljubljanskega barja in Save.

Vodovje reke Ljubljanice (3) se pojavi z izvirom Trbuhovice na Babnem polju, ki kasneje ponikne. Naslednji je izvir reke Loški Obrh na Loškem polju. Sledijo Stržen na Cerkniškem jezeru, Rak ob Rakovem Škocjanu, Pivka iz Pivške kotline, Unica na Planinskem polju in končno Ljubljana od izvirov ob Vrhniki in Verdu do izliva v Savo.

Vodovje v upravljanju RD Vrhnika je del vodovja reke Ljubljanice in je tesno povezano z delom vodovja po toku navzgor vse do izvira Pivke in Trbuhovice z ene strani in daje vodovje za tok reke Ljubljanice po toku navzdol.

V resnici je kvaliteta vode rezultanta kvalitete vode, ki prihaja iz toka navzgor ter onesnaževanja na področju vodovja v upravljanju RD Vrhnika ter prepušča kvaliteto vode po toku reke Ljubljanice skozi barje, Ljubljano, Zalog in do reke Save, ki ji prepusti vse vsebine, dobre in slabe.

Okoljske in prostorske značilnosti ali vsebine:

- gospodarske osnove okolja Vrhnike, Logatca, Borovnice in drugih krajev ali območij, ki se nahajajo na površini padavinskega zaledja (industrija, kmetijstvo, energetika, transport itd.),
- socialne osnove eko sistema,
- zdravstvene osnove eko sistema,
- kulturno, zgodovinsko in graditeljsko nasledstvo.

Mislimo, da je okolje RD Vrhnika zelo zapleteno (4). Ni si možno zatisniti oči in misliti, da je možno z enostavnimi prijemi reševanti sonaravno uravnoteženo, trajnostno prihodnost RD Vrhnika. Vse je odvisno od fizičnega stanja vodovja, dužbeno-političnega stanja prbivalstva, gospodarskih in socialnih pogojev, zdravstvenega stanja prbivalstva in narave, bogatega nasledstva iz preteklosti in skrbi za nasledstvo v prihodnosti do dnevnega upravljanja članov RD Vrhnika z vodovjem Ljubljanice.

V razmišljanje podajamo dve pomembni izhodišči in sicer:

- trajnostna prihodnost je sonaravno uravnoteženo življenje ljudi in narave. Izhaja iz potrebe po dolgoročnem zagotavljanju preživetja naše civilizacije in predstavlja idealizirani vendar mogoč cilj, in

¹⁴ Nedžad Ajanović, magister okoljskih ved (Calgary, Canada), vodja dela UN FAO v Rimu za Evropo in mladi raziskovalec.



- koncem drugega milenija se čedalje izraziteje pojavljajo globalni, območni, državni in lokalni problemi, ki so posledica delovanja sistema klimatskih sprememb.

Namen našega prispevka je pomagati pri razumevanju delovanja sistema klimatskih sprememb (5) na delo RD Vrhinka.

Za trajnostno prihodnost RD Vrhnika ima velik pomen sposobnost prilagajanja spremembam, ki jih povzroča sistem klimatskih sprememb. Pri tem je potrebno upoštevati globalne, in ozko lokalne značilnosti.

Lep primer so škode zaradi vedno večjega števila kormoranov. Večina ribičev misli, da je potrebno uničevati kormorane, če hočemo ohraniti ribe v naših vodah.

V resnici s streljanjem kormoranov ne bomo rešili ničesar, povečavali bomo le obremenitev naravnega okolja z uporabljenim svincem. Pojav kormorani v naših vodah je posledica delovanja sistema klimatskih sprememb in za reševanje sožitja rib in kormoranov bi bilo potrebno delovati veliko bolj zapleteno, kot samo uničevati kormorane. Da ne omenimo, da si vsi zatiskamo oči pri ocenjevanju stanja naših voda, ki so biološko degradirane in pri reševanju problemov, ki smo jih povzročili sami, tiho pričakujejo našo pomoč¹⁵.

Kvaliteta voda je rezultanta delovanja vseh omenjenih udeležencev v lokalnem eko sistemu ter tistih iz sistemsko povezanih lokalnih območij – površinsko padavinskega zaledja. Naj omenimo:

- **ni vzroka, da onesnažene vode spuščamo v naravno vodno okolje!** Na območju RD Vrhnika in ostalih sistemsko povezanih območij površinsko padavinskega zaledja večina kanalizacije konča v Ljubljanci. Vse onesnažene vode iz avtocest končajo v Ljubljanci. Vse onesnažene površinske in podtalne vode iz kmetijskih površin končajo v Ljubljanci. Vse onesnažene vode iz humanega eko sistema (mestna okolja) končajo v Ljubljanci,
- **ni vzroka, da ne uporabljamo eko remediacijske tehnologije za varovanje voda reke Ljubljanice na področju voda v upravljanju RD Vrhnika!** Verjetno je to prva omemba eko remediacije v bogati dokumentaciji RD Vrhnika in če je, mislimo, da je čas, da se začne delati na aktivnem reševanju problematike kvalitete voda reke Ljubljanice,
- **ni vzroka, da ni sodelovanja z eko sistemi po toku vodovja reke Ljubljanice navzgor in navzdol!** Skupni interes naj bi bil v zagotavljanju trajnostne prihodnosti.

Kvaliteta vode v naravnem okolju površinsko padavinskega zaledja reke Ljubljanice in same reke je daleč od kvalitete, ki bi jo imela v pogojih, ki jih zagotavlja narava.

Degradacija vodnega okolja je prisotna pri vseh naravnih združbah. Največ škode povzročajo sintetične kemijske spojine, razgradne snovi iz energetske porabe (transport) in odplake iz kmetijskih zemljišč ter gospodinjstev.

¹⁵ Potrebno je razlikovati delovanja humanega eko sistema na posamezne sisteme v naravi. Kadar govorimo o vodovju je človek edini, ki je spremenil fizikalnost, biologijo, kemijo in bioto vodnih sistemov. Večina okoljskih onesnaževanj rezultira v vodovju (sintetične kemične spojine iz gospodinjstev, kmetijstva, industrije in transporta). Melioracijska dela so ravno tako spremenila kvaliteto vodovja.



Mislimo, da je potrebno zagovarjati zaščito narave, okolja in prostora kot možno kvaliteto za trajnostno prihodnost.

Zadnjih trideset let naša civilizacija globalno in lokalno vlaga velike napore za doseg ravnovesja med naravo in humanim eko sistemom. Od Štokholmske konference, Rimskega kluba (1972 – 2005), ustanovitve agencije za okolje (UNEP) Združenih Narodov – ZN, konference v Riu 1992 – Agenda 21, konference v Johannesburgu 2002 do sedanjih naložb v prihodnjo zaščito narave, okolja in prostora. Naj omenimo Agendo za spremembe (6) in Agendo 21 (7), ki sta neobvezujoča dokumenta za pospeševanje trajnostne prihodnosti Zemlje, kontinentov, območij, držav, lokalnega okolja in prostora do Agend 21 posameznih subjektov, nastalih ob srečanju na vrhu v Riu 1992. Agenda 21 za Slovenijo, ki je bila izdelana 1995 leta, ni dosegla potrebne energije uresničevanja in je ostala za Slovenijo samo zgodovina. Mislimo, da je potrebno obnoviti prizadevanja in priporočamo izdelavo Agende 21 za območje gospodarjenja RD Vrhnika. Na ta način bi dobili možnost sodelovanja z ostalimi subjekti, občino, vlado, sosednimi območji in drugimi.

Sistem klimatskih sprememb deluje na naravo, prostor in okolje v smislu spreminjanja pogojev življenja. To ni prvič na planetu Zemlja, da sistem klimatskih sprememb kroji usodo živih bitij. Vsaj dvakrat v zgodovini Zemlje smo imeli podobne dogodke. Zadnji primer je bil, okrog 600 milijonov let nazaj, ko so izumrli dinozavri. Vendar je sedanja situacija povsem drugačen primer. Zaradi delovanja človeškega eko sistema, se je znotraj narave sprostil proces sprememb, ki jih uresničuje sistem klimatskih sprememb.

Sistem klimatskih sprememb je graditelj, varnostnik in motor klimatskih ali življenskih pogojev biosfere Zemlje. Z zagotavljanjem medsebojnega delovanja, odvisnosti in sodelovanja sistema klimatskih sprememb, sistemov znotraj sistema klimatskih sprememb in ostalih sistemov v biosferi Zemlje (kot celosten planet) sistem klimatskih sprememb zagotavlja življenske pogoje za bioto biosfere.

Glede na stanje sistema klimatskih sprememb mislimo, da lahko pričakujemo naslednje probleme na območju RD Vrhnika:

- **poplave** – zaradi spremembe intenzitete atmosferskih padavin, povečane količine padavin v časovni enoti ter nepredvidljivega časa pojavljanja lahko kadarkoli pride do poplav na vsem območju RD Vrhnika. Potrebno bi bilo skupaj s širšo družbeno skupnostjo (občina) doseči dogovor o sodelovanju pri preprečevanju poplav v povezavi s spremembami, ki jih prinaša sistem klimatskih sprememb,
- **suše** – glede na spremenjeno klimo, lahko pričakujemo tudi dalj časa trajajoče sušne intervale. To je situacija, ki lahko povzroči velike izgube biote vode. Predlagamo, da se dogovori izdelava zadrževalnikov vode¹⁶, ki bi v času omenjenih sušnih intervalov zagotavljali vodo in kisik¹⁷,
- **višje temperature** – glede na vse višje povprečne temperature okolja (voda, zrak, tla) in občutljivosti biote predlagamo, da se zastavi spremljanje bioloških pokazateljev, ki bi

¹⁶ Zadrževalniki vode omogočajo poleg omenjene kvalitete še dodatne možnosti: uporaba vode za potrebe gašenja požarov v mestnem, primestnem in podeželskem okolju, omogočajo uporabo reciklirane vode itd.

¹⁷ Zagotavljanje kisika se lahko dodatno omogča s sistemi aeracije vode, ki je vsekakor priporočljiva tehnološka rešitev.



omogočali spremljanje sprememb in možno ukrepanje (kormorani, nove vrste insektov, migracija ribjih vrst itd.),

- **glede na spremembe v delovanju sončnih žarkov predlagamo**, da se priporoči članstvu RD Vrhnika, da v času od 11.00 ure dopoldan do 15.00 ure popoldan ne izpostavljajo soncu nezaščitene kože,
- **glede na spreminjanje pogojev življenja rastlinskih vrst**, ki se ne bodo mogle prilagoditi in bodo izumrle (kostanji, nekateri iglavci, nekatero grmovlje), predlagamo, da se izdelata dolgoročni plan nadomestitve ogroženih vrst z novimi, ki se lahko prilagodijo na spremembe v naravi.

Mislamo, da je prav, da omenimo sedanja prizadevanja na globalnem področju kot so: Milenijski cilji ZN (UN Millenium Goals)¹⁸, Bellago principi za zagotavljanje čiste vode, sanitacije in higijene prebivalstva, vseživljensko izobraževanje ter čedalje bolj pomembno sodelovanje na vseh področjih od lokalne, območne, državne do mednarodne skupnosti.

Sposobnost RD Vrhnika, da sodeluje, se prilagaja in se aktivno udeležuje procesa sonaravno uravnovešenega ali trajnostnega razvoja oziroma procesa trajnostne prihodnosti, je tista kvaliteta, ki bo omogočala delo in prihodnost RD Vrhnika in njenega članstva.

Narave, kot smo jo poznali, ni več. Sedaj je odločilno, kako lahko pomagamo sebi in svojim, da omogočimo napredek v pogojih življenja jutri.

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6.

¹⁸ Milenijski cilji: do leta 2015 naj bi se za polovico zmanjšalo število ljudi, ki so ogroženi zaradi: 1. revščine in pomankanja hrane, 2. pomankanjem izobraževanja, 3. neenakosti moških in žensk, 4. smrtnosti otrok, 5. obolenosti in smrtnosti nosečnic in mater v začetnem obdobju materinstva, 6. širjenje AIDSa, malarije, tuberkuloze in drugih bolezni, 7. delovanja zaradi čezmernega izkoriščanja naravnih virov, in 8. pomankanja sodelovanja pri globalnem partnerstvu za razvoj.



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World Peace and Science

The presentation of the “World Peace and Science” is connected with “Quality of Life” and the impact of the technologies, and has been written by Prof. Dr. Timi Ecimovic¹⁹, and Sir Prof. Dr. Roger Haw²⁰ as contribution for the Sustainable Future of our civilisation, and has been written for World Peace Summit in Zagreb, Croatia 09th October 2005 International Conference.

The Abstract

The peace of all humans on the Earth is very complex issue, and the science and education has to play significant role for evolvement of this value. The greatest modern achievement of our civilisation should be foundation for the World Peace, and let us hope to add small brick into this effort by presenting this article.

The science as permanent counterpart of our civilization achievements is result of human activities, and is making main contribution towards evolvement of the socio/economic human system of present civilization.

The “Quality of Life” is non defined complex, abstract and actual, reach and poor, and many other attributes worth definition of the life style, and could be part of individual, or civilisation, or national or global human society.

New approach to complex solving research using Thinking Theory has resulted with new thinking about **LIFE** origin, presentation and future.

What is the Sustainable Future, and how to use science to assist sustainable future of our civilization?

The Keywords

World Peace, Sciences, Quality of Life, Sustainable Future, nature, space and environment protection, the Climate Change System, World Government

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The Presentation

From the beginning of human kind of this civilization some over 100000 years before, last glacial time till some 16000 year ago, when Scandinavian Shield emerged from ice and Baltic Sea reappear, our civilization was writing epic song of own evolvement: from tribe with Chief and Spiritual leader, over stone age, ancient times, antiquity, mediaeval, industrial and to present information/innovative society, which was result of individual members of society ability to research and understand basics of nature, space and environment as background for our own existence.

In Stone Age the religion, best assistant of humans for ruling over them and by them appear, and become best assistant to Chiefs of tribes. Society with rudiments of economy was vulnerable and humans were in very low numbers. Science was at those times at beginning of practice/accumulation. The information exchange was still underdeveloped, and humans new what mothers were teaching them and what life was teaching them. With socio/economic evolution under sciences guiding, the kingdoms of antiquity emerged together with slavery, and great kingdoms of China, Persia, Babylon, Egypt, Greeks, and Romans appear and disappear, and it was time of great scientific achievements. Writing and reading, Literature, Philosophy, Mathematics, Physics, and great scientist like: Plato (427? – 347? B.C.), and his pupil Aristotle (384 – 322 B.C.), and many more sciences were established, and played important role for human society evolvement. The information exchange improved, money as human servant was invented, religions become important partners of rulers, and that was time of great enlargement of the human civilisation. Education was established and humans could learn as much as wished or been able.

Medieval time with many brakes for social evolvements, and great scientist as Galileo (1564 – 1642), Copernicus (1473 – 1543), and Newton (1642 – 1727) to mention have contributed major part of scientific knowledge and possibilities for further explorations before pre and industrial era. Information exchange did not improve a much, slavery was just to end antique form, and money system developed basics of banking.

The Most Valuable Thing in Life

Shakespeare (1564 – 1616) remarks, “Time tests all things. Some he delights and others fear him; he brings gladness to the good and fear of consequences to those that have done evil; he makes mistaken ideas to grow and flourish in some cases, and in others he clears up errors.” Hence, the simplest definition is that time is a creator and destroyer. To sum up, Time is abstract and at the same time omnipotent. He has been in existence even before creation. Time has no age, no limit. In other words “Time” is eternal. Time is the most valuable thing a man can spend. No one has ever denied this statement, for it definitely is true.

Usually, when you ask a person “what do you value most?” It is not uncommon for him to answer immediately the word “money”. But money is not something that everyone has. I think “time” is more valuable than more money. It is shared among all, whether rich or poor, good or bad, we all have equal amount of “time”, and nobody can say that he does not have time. The saying, “Time and tide wait for no man” is very true. Once time is gone, we will never be able to get it back. People who waste their time will only regret it when they are in most need of it. This applies especially to students.



The scientists' achievements²¹ during the past years have contributed tremendously to man's progress towards civilisation. In the field of medicine, the names of William Harvey, Hippocrates, Louis Pasteur and many others shine. Sir Alexander Fleming. Experiments on very tiny objects by scientists, doctors and medical students today are carried out with the help of microscopes which magnify the very tiny objects placed under the lens. Therefore the invention of microscope by Zacharias Janssen, a Dutch optician, has helped mankind tremendously.

In the field of electricity, the name of Michael Faraday is well known. He was the one who gave the world the first dynamo which generates electricity. The name of Thomas Alva Edison is no less important in science. He was the inventor who gave light to the world. The scientists' invention of the atomic bomb has been both a blessing and a curse to people in the Second World War. To the Japanese nation it was an eternal curse but to the people under the Japanese it was a great blessing because the dropping of the two atomic bombs on Hiroshima and Nagasaki freed them from their conquerors and brought the war to an immediate end. The modern invention of rockets has raised the hopes of the people of having a chance to live on the moon in time to come. The rockets have enabled men to conquer space. So far many rockets have been successfully launched into space and more will be sent by the USA, Russia & China.

All these inventions of scientists and the benefits they have brought to mankind cannot be denied. They have improved the lives of all the people around the world and have given them a life of comfort. What a great contribution to mankind these inventions are!

The most noteworthy invention of the 20th century is aeroplanes that can travel faster than sound. These are the supersonic jets and it is rumoured in western circles. From Singapore, India can be reached in less than twenty minutes and Peking/Beijing in about an hour. The most astounding inventions are: to transform seawater into fresh drinking water by the removal of salinity from seawater.

In 15th to 19th century, indeed the achievements of such inventors like Caxton, James Watt and Alexander Graham Bell will have repercussions upon the 20th century, which are easy to imaging but impossible to measure. Caxton must be honoured and remembered for his great invention—the printing press. It was said to have been first invented by the Chinese and that before long German carried this idea to the West. Soon a young Englishman called Caxton copied this idea and he succeeded in making a miniature model of the printing press. This model was improved again until now thousands of copies of printing matter can be rolled out of the machine in an hour's time.

With the invention of the printing press, books are printed in millions and their prices greatly reduced. Thus this invention helped and is still helping to bring within the reach of the poor, the treasure of invaluable knowledge that was once the exclusive rights of the rich. As a result, the knowledge of the public is raised and education is available to all.

Another wonderful invention is the steam engine contributed by James Watt. This made possible the advent of steam ships and railway trains. Another important invention is the

²¹ By Sir Prof. Dr. Roger Haw



invention of telephone by Graham Bell. Today we have millions of telephones throughout the world.

There is a saying that today's luxuries are tomorrow's necessities. It is usually an invention that illustrates the truth of this, for progress is inevitable with the human race. Inventions which are needed come readily to mind when we think of our comfort and convenience. We need a patent shoe that has a layer of compressed air inside on which our feet will never tire over the longest journey.

So fast is the pace of modern progress that we can safely say no invention today is beyond the possibility of perfection in the future. Now let us consider the weight of the proverb "Necessity is the mother of invention." Take for instance the modern wristwatches. Seventy years ago people were not wearing wristwatches but were carrying pocket watches. It was quite inconvenient to take out the watch from the pocket whenever one wanted to know the time.

Modern life has become so attached to electricity that life would seem drudgery without it. What is a world without this great wonder of the 20th century? The coming of electricity has removed darkness and gloom enwrapping the world and the world has been transformed into a well-illuminated paradise.

In cold we are heated by the electric heaters, in summer we are provided with air conditioners and electric fans to cool us. We have thousands of things using electricity. All these things are available today and life has been made easier due to the discovery of electricity.

Science has made great strides in this century and needless to say it is greatly due to electricity. Alexander Fleming's invention of Penicillin would not have been possible, had he not made use of electricity and electrically run apparatus. The modern use of ultra-violet rays and treatment of cancer would not have been possible had it not been for the use of electricity. Transport, communication, medical science and so many other branches of inventions and discoveries are made possible due to the availability of electric power.

Hydroelectricity uses water to produce electricity. Even this is made possible because electric motors are needed for the proper function of engines and machineries. Man has at last conquered space and landed on the moon, thanks to electric power. Electricity has also illuminated the knowledge of man and accelerated his thirst for new inventions. Thanks to the man who had discovered electricity.

Every day as more and more rockets rise into the sky, we are made more and more aware of the existence of planets beyond our own. Yet these Planets towards which man aims to land are only the planets that revolve around our sun. There are millions and billions and trillions of suns in the universes. These suns are called stars. Indeed distances in space are so vast that astronomers have found it more convenient to use a scale known as the light year. The light year is the distance traversed by a beam of light travelling day and night at the non fluctuating speed of 186,000 miles per second for one year.

The earth is one of nine planets that revolve around the sun. The sun is one of 200,000,000,000 other stars that together form our galaxy. The space probe is conducted by almost all of the scientifically advanced countries. The U.S.A., Russia and Japan are however



on the forefront. The whole question is that each nation is selfish and does not wish to share its discoveries and findings. If the scientific resources of the whole world can be pooled with a central organization to conduct further space probes, I am sure the results will be quicker to get and mankind shall benefit much from its scientists. However, to be selfish is inborn in man. It is an instinct that cannot be erased. God alone knows when good sense and unselfishness are going to prevail for the betterment of this cursed race.

Finally we should ask ourselves as to where science is leading us - to prosperity or to annihilation? The answer cannot be given at this stage. We shall have to wait and see.

Science and culture are intimately inter-related. This sounds paradoxical to most of us. For us science is a series of deadly nuclear weapons or a continuous process of mixture of chemicals and in terms of biology it is wriggling earthworms and endless dissection of lower animals. It is the healer and builder and the propagator of untold suffering and death, whereas culture implies refinement such a myths, art, dame's drama and religion. Science is not just a set of facts. It is man's attempt to understand nature. Science covers all aspects of the phenomenon of nature. As for the word "culture", it refers both to basic and universal human traits such as tool-making, shelter building and the wearing of clothing and to that aspect which implies art, religion, myth and the like. The point is clear. Culture is shaped by the needs and limitation of life. It tries to explain the great phenomenon of life. Science too is man's attempt to understand and explain the nature of life. It is plain then, that culture and science have a connection. They have a common denominator in their origin. Culture is influenced by the facts of life and science and racial prejudice. In conclusion we must admit that the relationship between science and culture are manmade²².

To follow from Stone Age to Industrial Society and further - the Industrial society make background for population explosion, scientific and applied research, socio/economic system, life quality, information exchange, money – master system, large human killing systems and big wars, genocide activities, terrorist activities, large enlargement of urban societies, and large evolvement of education/scientific system.

By the end of industrial era information package was doubling in matter of months, with possibilities for faster information exchange, classical slavery was almost eradicated, modern slavery was taking more and more of urban life, quality of life was at high standard possibilities, which could be gained by money system – money/master or monster, which developed to the status of monster, local, national and international bureaucracies took all ruling into their hands, sciences become not understandable due to countless specialisations, and individual approach become basic expression of humans of information society.

Science with many famous humans working on theoretical and applied research allowed tremendous evolvement of physics (Einstein, Hawking and many more), chemistry, mathematics, rocketry, astronomy, nuclear technologies, genome research, nanotechnologies, quantum theory, big bang, and elementary particles – quarks and mesons, and Grand Unified Theory etc. and today is quite a difficult to know all achievements, at list by one individual human. So evolvement continue with population explosion up to over 6 billion humans,

²² Follow contribution by both authors!



correspondingly the nature, space and environment protection, quality of life conditions decreased, impact of the climate change system, entire biosphere and life conditions change with pollution of lands, seas and oceans, and atmosphere.

By commencement of third millennium our global society was emerging, guided by money – monster system. Individual human did not establish global society, but it was established because of money system needs for feeding countless forms of human – money slavery. For leadership by individual human of global society we shall be waiting longer to appear, because society did not emerge by itself, but by socio/economic system.

Second to money – monster leading socio/economic system within global society emerged very strong bureaucratic local, national and international system. Totalitarian like ruling practice supported by bureaucrats, with countless forms understood only by issuing bureaucrat, and ruling practice by paper and computer, resulted with total control of: information dissemination, sciences work, military and security forces, education, culture, and whole of human socio/economic system. Global society has come under two masters: ever increasing bureaucracy and always hungry money – monster system. Democracy as term is in practical use as camouflage for undercover ruling practice. Only real term, which may be proper, is money – democracy.

Science become servant to military needs and major part of discoveries have been in close connections with production of killing devices for destruction of non-accepted part of human global society. The scientist, who is connected with military project, is rich scientist, the rest of scientist are wandering between education, research and family needs. Independent scientist does not exist in practice.

So we entered 21st century with over six billions of people, and if we say have 2 % of maths gifted people it means with 120 million of them, and consequently with tremendously developed technical sciences and sciences based upon mathematics and physics, second to them are social sciences. The natural sciences are doing their best to follow, but are more and more behind. As answer the global society has more great achievements as:

- Nuclear technologies, which should never been allowed to leave research laboratory, we have for next two million years additional pollution by nuclear radiation, more nuclear killing devices as needed and serious threat for possible destruction of biosphere, and some benefits to society as medical curing procedure, nuclear power stations and nuclear energy potentialities. Major beneficiary are military and their ruler politicians and bureaucrats,
- Synthetic chemistry with countless number of synthetic new compounds (never been before in the nature) using them for the purpose of making money and resulting with: CFC's – ozone protection layer destroying compound, PCB's – gene changing compound, Pesticides – destroyers of lands and waters, and many more similar compounds and some positive products, but all of them as money accumulation practice, and many of them as dangerous the nature, space and environment pollutants,
- Technical and technological improvements resulted with: over billion of explosive engines, white technique in billions peace's, computers and information exchange devices in billions, big war machines from tanks, aircrafts, air carriers and other ships, space-crafts, satellites and other devices like launching sites, large mega towns and other urban environments, roads and landing sites, ports and tourist developments or in



total to human eco environment as large part of the nature, all of them are pollution devices and waste, which will become waste before or latter after certain time.

- Science achievements include: Theory of Relativity, Quantum Theory, Nuclear discoveries, particles and rays discoveries, Grand Unified Theory, sensors, Nano – technologies, Big Bang Theory, Cybernetics, String and Theory of Everything, Thinking Theory and many more theories including recent Information Theory of Nature. Less successful was science at nature research of the Earth Biosphere and knowledge treasures of the Nature. Social sciences development and information exchange research have great impact to global society, etc. Environmental science as new comer is asking permission to enter public awareness.

The Nature – Biosphere received and reacted with following:

- Pollution of all sorts from synthetic chemical substances (PCB's, CFC's and others), smog producing substances, ground ozone, Nitrogen Oxides, whole package from petrol consumption residues, residues from medicaments including female hormones and them like substances from plastic materials degradation, plastic materials in countless forms, pollution of waters – practically it does not exist drinking water, but water as drinking water and according to standard (minimum quantities allowed content – standard), content of synthetic chemicals and other pollutants, from transport system (land, seas and air) as impact of human society or human eco system on the biosphere.
- Waste in countless forms and with landfills of all sorts and locations. Major production of present society is waste, which may be useful at beginning, but cannot stand long time use. For instance most expensive product, which humans are buying in millions – automobile, had birth just over hundred years ago, and today is major environmental problem. Last 150 years our civilization waste production was overtaking many times all other activities, of course depends of viewpoint.
- Major the biosphere pollutant is civilization as per number of population. It could be described like during 18th century the land was abundant, the water was abundant and air was abundant and it lasted till middle of 20th century, after till end of it the land was not so abundant and water become even less abundant, only air looked as abundant. And now in 21st century we know even air is not as abundant as was. Only abundant is our civilization by numbers of people, quantities of pollution and destruction of own environment – the Earth Biosphere.
- Major reaction due to human influence as triggering effect of ozone layer destruction, global warming, due to by pollution introduced air degradation, and interferences within interdependences, interactions and co-operation of natural systems or within the nature and biosphere, the climate change system, provider, holder and guardian of living conditions on the planet Earth Biosphere commence moving. Practically it means that nobody can predict to which direction the climate change system will move to right – New Glacial era or left – Global Warming or somewhere between. In any case the living conditions as have been do not exist anymore!

It takes us to present. As result of unpredictability of the impact of the climate change system and consequences large research have been introduced for understanding of the biosphere



systems. The climate change system has been introduced. It takes us to environmental system thinking and consequently The Information Theory of the Nature has been invented.

Three magic words – interdependences, interactions and co-operation when placed within known or possible environment explain system background of the Nature.

What is The Information Theory of the Nature – there is no beginning, and no end, but it is LIFE or The Nature System as whole, or and as requisitely holistic unit – planet Earth. What we are trying to say is – our civilisation has taken right to interpret The Nature. On such way we have double interpretation of the Nature – first is as it is The Nature, and second is The Nature as seen by our civilisation.

The Information Theory of the Nature could be expressed by following equation:

$$\mathbf{M \text{ (matter)} \times E \text{ (energy)} \times I \text{ (information)} + T \text{ (time)} = \text{The Nature/LIFE}}$$

The equation has to be put into environment (in our case) – The Universe, The Earth – requisitely holistic unit, The Biosphere – our living space of The Earth, where basic relations are evolvments of the systems of the Earth Nature as interdependences, interactions and co-operations. The time is in equation just for sake of understanding.

The Information Theory of the Nature has been innovated as basic quality of The Nature or matter, energy, and information, where the information is an integral part of The Nature or matter and energy, and evolvment of matter and energy is inter - connected with evolvment of information. All this should be within an environment, and under the rules of interdependence, interaction and co-operation.

The Information Theory of the Nature is a case study of system theory/thinking implementation, as contribution toward better understanding of The Nature by our civilisation. The Information should not be interpreted as information by our standards (Webster's or any dictionary), or by Information Theory as processes of communications and the transmission of messages, or by Information Science – collection, storage and retrieval of information, and or by any other use of the word information at present (2005) practice.

The Information within The Information Theory of the Nature, we are dealing with in this contribution, is:

- Information is an integral part of basic environment,
- Information is an integral part of matter and energy,
- Information as an integral part of matter and energy is evolving as well as matter and energy,
- Information, matter and energy do not exist, if they are not an integral part of the system/environment – basic environment/The Universe,
- Information, energy and matter are evolving within the interdependences/interaction and co-operation rules of the all levels of systems within basic environment, and are making evolution of the Nature in case (requisitely holistic unit),
- Information, energy and matter could evolve into countless number of cases, depend of environment, systems and interdependences, interactions and co-operation rules within the environment,



- Information is ability of matter and energy, or and any part of environment, which is making possible countless forms, countless environments in our case requisitely holistic unit - the Earth and the biosphere, which is one of cases.

The information as part of The Information Theory of the Nature is ability/quality of environment, matter, energy, any particles, rays or any form of matter, energy or natural powers and forces. The Information Theory of the Nature is theoretical approach to basic problems of present understanding of the Nature, and looks like missing part, which have to make requisitely holistic presentation of requisitely holistic part of the nature.

The Information Theory of the Nature could explain any whole, part, system, unit, macro, mezzo and micro with non present limits, but with understanding of evolvement within environment, and putting in centre of requisitely holistic case environment, energy, matter, rays and particles, natural powers and forces regulated by interdependences, interaction and co-operation rules. The rules do not exist but are result of particular case content. As case we may mention environmental characteristics of the case are deciding on the rules – like liquid methane rivers and lakes on the Jupiter moon – Titan.

From transformation of matter, energy and information within environment under interdependences, interaction and co-operation rules up to present - today is our scientific understanding of The Nature.

In conclusion we think the World Peace could be achieved as commitment of humans for survival as sustainable future. New civilisation ethics, contract, values, moderate life style, one Earth one Government, and tolerance amongst peoples are some of basics for the World Peace of our civilisation.

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