

**SERBIA ACCELERATING INNOVATION AND GROWTH
ENTREPRENEURSHIP (SAIGE) PROJECT**

Program PRISMA

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

*Environmental Monitoring of Food and Waterborne Parasites
(PARASITE_HUNTER)*

FINAL DOCUMENT

Belgrade,
27/12/2023

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ABBREVIATIONS AND ACRONYMS

SRO	Scientific Research Organization
IMI	Institute for Medical Research
FBUB	Faculty of Biology, University of Belgrade
UNSFA	Faculty of Agriculture, University of Novi Sad
INMES	Institute of Meat Hygiene and Technology
UBFZF	Faculty of Philosophy, University of Belgrade
OHS	Occupational Health and Safety
SOP	Standard Operating Procedure
FWP	Food and Waterborne Parasites
SF	Science Fund of Republic of Serbia
PIU	Project Implementation Unit

EXECUTIVE SUMMARY

The environmental and social checklist screening carried out during the evaluation of the project is consistent with the ESMF classification and ranked the project as of moderate risk.

The screening result shows that this project has *low risk* considering and covered by ethics (Ethical approvals obtained) and *moderate* considering the environment.

The purpose of the Environmental and Social Management Plan is to highlight the negative environmental impacts and management problems during the preparation and implementation of the research project PARASITE_HUNTER awarded through the PRIZMA program by the Science fund of the Republic of Serbia.

The project aims to collect samples from domestic and wild animals, plants, soil and water which are human and/or animal food or are used to grow food and ascertain the presence and species identity of food and water borne parasites within. The capture-collar-release study on golden jackals has been elaborated on, the status of the golden jackal as a hunting species has been clarified and as such, it may only be captured on hunting grounds. The study on golden jackals already has received ethical approval, but any other relevant permissions to access and set traps in hunting areas, will be obtained from the Hunters association of Serbia (Lovački savez Srbije) by the project team once suitable grounds have been identified (based on observations of jackal presence). A cooperation agreement with the Hunters association will be made for that purpose.

Additionally, golden jackals will be investigated as a possible vector species for parasite transmission to domestic animals and humans through a capture-collar-release study and communication with major stakeholders, who are local food producers and/or providers, particularly family farmers and homesteaders, hunters and fishermen will be established. A questionnaire will be administered online to volunteers among the stakeholders to assess their knowledge and attitude regarding parasites and food safety.

As the project team aims to interact with stakeholders during project realization, to mitigate any possible adverse impacts, the project team includes a trained psychologist. The stakeholders with whom the project team wishes to establish communication and cooperation, will be identified through online searches of farmer's cooperative websites and/or personal commercial websites and contacted only using publicly available information posted on the sites. The project goals will be explained in detail and interested stakeholders will be asked to participate in project realization primarily through answering questionnaires. No personal information will be collected and participating stakeholders will be asked to sign a consent form. The questionnaire study has already received ethical approval.

Any concerns and possible negative impacts of infectious and chemical waste and discarding of animal tissues during project realization have been addressed in the mitigation plan.

Occupational safety of the project team and laboratory biosafety measures, including handling of infectious materials and chemicals, have been detailed.

The contents of this ESMP document are a brief project description with a background which is relevant for the assessment, including the current state of the environment in which the project will be realized (within the Belgrade urban and peri-urban area), the legal framework which accompanies

project realization, identification of sensitive receptors, potential impact and impact assessment. The key components of this document are the mitigation and monitoring plans.

After conducting a thorough analysis of the state of the relevant surroundings in which the project will be realized and potential project impacts, no sensitive receptors could be identified. The project team strongly believe that with the additional information, clarifications, mitigation actions and monitoring proposed herein, the environmental and social risks will be reduced.

As noted above, there are specific environmental risks related activities out of SROs (collecting samples from domestic and wild animals, plants, soil and water) and work in participating SROs laboratories.

There are specific social risks associated with sampling - all raised concerns can be readily addressed through mitigation measures.

This ESMP is therefore prepared to set out specific mitigation, monitoring, and institutional measures to be taken during implementation to eliminate adverse environmental and social impacts, offset them or reduce them to acceptable levels.

LEGAL AND ADMINISTRATIVE FRAMEWORK

LEGAL FRAMEWORK

Relevant laws of the Republic of Serbia

All laboratory work, sampling procedures, field work and waste management will be in concordance with the relevant laws and/or management strategies of the Republic of Serbia, including specific rulebooks: The National Strategy for Sustainable Development ("Official Gazette of RS" No. 72/09, 81/09), Law on environmental protection ("Official Gazette of RS" No. 135/04, 36/09, 72/09, 43/11, 14/16, 76/18 and 95/18), Law on Science and Research ("Official Gazette of RS" No. 49/19), Law on Occupational Health and Safety ("Official Gazette of RS", 35/2023), Law on Fire Protection ("Official Gazette of RS", Nos. 111/2009, 20/2015, 87/2018 and 87/2018); Rulebook on preventive measures for safe and healthy work to prevent the occurrence and spread of infectious disease epidemics ("Official Gazette of RS", No. 94/2020), Rulebook on preventative measures for safe and healthy work when exposed to biological hazards ("Official Gazette of RS", 96/2010 and 115/2020), Rulebook on personal protective equipment ("Official Gazette of RS", No. 23/2020), Rulebook on preventive measures for safe and healthy work at the workplace ("Official Gazette of RS", Nos. 21/2009 and 1/2019), Rulebook on preventive measures for safe and healthy work when exposed to chemical substances ("Official Gazette of RS", Nos. 106/2009, 117/2017, 107/2021), Rulebook on the provision of signs for safety or health at work ("Official Gazette of RS", Nos. 95/2010 and 108/2017), Rulebook on the provision of first aid, the type of means and equipment that must be provided at the workplace, the method and deadlines for training employees to provide first aid ("Official Gazette of RS", No.109/2016), Rulebook on preventive measures for safe and healthy work when exposed to carcinogens or mutagens, ("Official Gazette of RS", Nos. 96/2011 and 117/2017), Rulebook on the provision of signs for safety and health at work ("Official Gazette of RS", Nos. 95/2010 and 108/2017), Rulebook on preventive measures for safe and healthy work when using work equipment ("Official Gazette of RS", Nos. 23/2009, 123/2012, 102/2015 and 101/2018), Rulebook on the procedure for inspecting and checking work equipment and testing working environment conditions ("Official Gazette of RS", Nos. 94/2006, 108/2006, 114/2014 and 102/2015), Rulebook on records in the field of safety and health at work ("Official Gazette of RS", Nos. 62/2007 and 102/2015), Rulebook on the

manner and procedure of risk assessment at the workplace and in the working environment, ("Official Gazette of RS", Nos. 72/2006, 84/2006, 30/2010 and 102/2015).

Waste will be managed according to The Waste Management Program in the Republic of Serbia for the period 2022 – 2031, Law on waste management ("Official Gazette of RS", 36/09, 88/10, 14/16 and 95/2018) Law on noise protection ("Official Gazette of RS", 36/09, 88/10 and 96/2021), The Law on Packaging and Packaging Waste ("Official Gazette of RS", No. 36/2009 and 95/2018), The Law on Veterinary Medicine ("Official Gazette of the RS", No. 91/05, 30/10, 93/12 and 17/19-other law). Additionally, project specific SOPs will integrate the principles of The Law on Veterinary Medicine ("Official Gazette of the RS", No. 91/05, 30/10, 93/12 and 17/19-other law) with regard to materials presumed infectious of animal origin with zoonotic potential. In addition, the relevant rulebooks are: Rulebook on the manner of storage, packaging and marking of hazardous waste ("Official Gazette of RS", Nos. 92/2010 and 77/2021), Rulebook on categories, testing and classification of waste ("Official Gazette of RS", No. 56/10 and 93/2019), Rulebook on the form of daily records and annual report on waste with instructions for its completion ("Official Gazette of RS", Nos. 95/10 and 88/2015), Rulebook on the form of the document on the movement of hazardous waste, the form of prior notification of the method of its delivery and instructions for filling it in ("Official Gazette of RS", Nos. 114/2013 and 17/2017), Rulebook on the document form on the movement of waste and instructions for its completion ("Official Gazette of RS", No. 72/2009), Rulebook on the method and procedure of pharmaceutical waste management ("Official Gazette of RS", No. 49/2019), Rulebook on medical waste management ("Official Gazette of RS", No. 48/2019), Regulative on using company cars ("Official Gazette of RSS", No. 49/2014 and 15/2015).

In addition to observing the relevant laws and rulebooks, the lead and participant SROs implementing the project will abide by the rules of best fieldwork and laboratory work practice and the internal relevant rulebooks that regulate the matter.

Project will also follow all institutional acts, rulebooks and procedures.

Relevant Institutions

The Ministry of Environmental Protection of the Republic of Serbia is responsible for proposing legislature concerning environmental protection and environmental policy and monitors implementation. The Ministry of Science, Technological development and Innovation proposes laws on Science and Research, including funding policy. The Ministry of Health of the Republic of Serbia is responsible for policy and proposing legislature on regulating medical waste. The Veterinary Directorate of the Ministry of Agriculture, Forestry and Water Management proposes policy and legislature on prevention of epidemics, managing animal waste (including carcasses) and animal welfare and monitors implementation. The Ministry of Labor, Veterans and Social Policy proposes legislature on worker's rights and safety in the workplace and monitors implementation. The other relevant institutions are: Institute for Nature Conservation of Serbia, *Srbijašume* (Serbia Forests) and *Lovački savez Srbije* (Serbian Hunters Association).

The roles of SROs in the context of the ESMP are provided in the table with mitigation measures planned.

PROJECT DESCRIPTION

Project Proposal Title: **Environmental Monitoring of Food and Waterborne Parasites**

Acronym: **PARASITE_HUNTER**

Sub-program: **Natural Sciences**

Lead SRO and address:

INSTITUTE FOR MEDICAL RESEARCH, University of Belgrade (IMI), National Institute of Republic of Serbia, Dr. Subotića 4, 11129 Belgrade, SERBIA

Partner SROs:

FACULTY OF BIOLOGY, University of Belgrade (FBUB)

FACULTY OF PHILOSOPHY, University of Belgrade (UBFZF)

FACULTY OF AGRICULTURE, University of Novi Sad (UNSFA)

INSTITUTE OF MEAT HYGIENE AND TECHNOLOGY (INMES)

PARASITE_HUNTER aims to devise a holistic framework for the surveillance FWP and assess their impact on food safety by implementing a One Health approach. The objective is to detect, identify, quantify and estimate the viability of environmentally transmissible forms (eggs, cysts and oocysts) of 24 FWP of public health significance¹. Detection and species identification of FWP, including helminths (nematodes, cestodes, flukes) and protozoa (coccidia, Amoebozoa, Metamonada), which represent specialists (specific host required for transmission) and generalists (multiple hosts can transmit) will be done with the specific objective to analyze parasite diversity, particularly the ratio of specialist (Sp) to generalist (G) species of certain genera, which will allow insight into ecosystem health via the complexity of the food web within. The matrices which will be tested are: foods, specifically seasonal leafy vegetables, domestic animal/river fish (tissues and intestinal content); feed, such as hay and other roughage and urban and peri-urban wildlife (tissues and intestinal content). Two environmental matrices which are necessary for food/feed production, soil and water, will also be investigated for parasite presence. Freshwater branchiopods and copepods, which are rarely investigated as FWP reservoirs, will be integrated in food safety assessment through examination of tissues and intestinal content.

The project duration is 3 years, as per the funding propositions.

ASSESSMENT OF THE POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS OF SPECIFIC TASKS WITHIN THE PROJECT

The SROs implementing the project will ensure, through abiding by the state laws and rulebooks that none of the project related activities will have a disruptive bearing of any kind on the baseline data (in any of its segments, including the soil, air quality, waste, water resources, flora and fauna, or noise levels).

Potential impact on sampling sites

(for collecting samples from domestic and wild animals, plants, soil and water)

Collecting samples from domestic and wild animals

The sample collection area for PARASITE_HUNTER is located will span the urban and peri-urban area of Belgrade, which covers 3,222.68 km² in total, with an inner urban area of 359.96 km²². Belgrade lies on the confluence of the Danube and Sava rivers and the combined length of the riverbanks is estimated to be 200 km, while 16 river islands are distributed across the area³. Belgrade city is surrounded by agricultural land and pastures which supply its 29 green markets and through which a significant portion of the citizens' (approximately a quarter of Serbia's population) food needs are met.

¹ Bouwknecht et al., 2018

²

[https://en.wikipedia.org/wiki/Belgrade#:~:text=The%20city%20has%20an%20urban,303%20m%20\(994%20ft\)](https://en.wikipedia.org/wiki/Belgrade#:~:text=The%20city%20has%20an%20urban,303%20m%20(994%20ft))

³ Drazic et al., 2014

The entire sampling area is located within an irregular pentagon encompassing Belgrade and its environs, with points at:

44° 23' 29" N, 20° 43' 54" E;

44° 32' 46" N, 20° 06' 45" E;

44° 53' 33" N, 20° 04' 22" E;

45° 04' 16" N, 20° 16' 37" E;

44° 58' 31" N, 20° 41' 26" E.

The peri-urban area of Belgrade comprises several different ecosystems which are natural such as forests (steppe and wooded steppe, floodplain broadleaved forests, Hungarian oak and Turkey oak forests) and aquatic (marshes, mires), as well as agricultural types (polyculture, permaculture, agroforests). The terrestrial ecosystems feature diverse habitats for various species of wildlife, which are interspersed and fragmented by agricultural plots and pastures. As the Danube and Sava rivers flow through nearly 60 km and 30 km of the Belgrade urban and peri-urban areas, respectively, different types of aquatic ecosystems are also incorporated into the existing landscape. This layout facilitates complex interactions between people, domestic and wild terrestrial and aquatic fauna at a macro and microscopic level, which will be examined through this project.

Serbia features several protected natural resources which cover around 5% of its territory and include strict and special nature reserves, national parks, national and nature monuments, protected habitats, landscapes of outstanding features and nature parks. In the Belgrade urban and peri-urban area, there are several different natural resources with various levels of governmental protection: landscapes of outstanding features *Kosmaj*, *Veliko ratno ostrvo* and *Avala*, strict nature reserves *Hajdučka česma*, *Lužnjak i Grab*, *Srebrna lipa* forest, national monuments Miocene sandbank at *Tašmajdan*, Senonian sandbank at *Mašin Majdan*, Moric neogene sandbank at *Kalemegdan* fortress, roe deer (*Capreolus capreolus*) antlers at Rogot forest (*šuma Rogot*), natural monuments such as the Loess profile *Kapela* in *Batajnica* and the *Zemun* Loess profile, protected botanical areas such as the *Košutnjak* forest, the arboretum of the faculty of forestry and *Miljakovačka* forest⁴. Rodent samples will be obtained strictly from localities which are not protected by Law on Nature Conservation and only from species considered pests, during preventative rodent control programs, and are thus without legal protection.

Samples and/or carcasses will be collected from hunting organizations and samples will be obtained free of charge if permitted or will be purchased directly (as the anticipated total cost is below the one necessitating public procurement) from the local hunting organizations. None of project work regarding sampling will be disruptive for the hunters' association. Several registered hunting grounds are located in the vicinity of Belgrade. Hunting grounds are administered on a local level by hunting organizations and by the Serbian Hunters association (*Lovački savez Srbije*) on a national level⁵. Some of the largest grounds are managed by the public corporation *Srbijašume*, which oversees and services the forests and regulates logging as well as clearing and re-forestation of specific sites. The three hunting grounds within the peri-urban area of Belgrade which are managed by *Srbijašume* include Rit (50 ha) located approximately 15 km north of Belgrade city, Crni Lug (973 ha) 20 km away from the city's airport in the suburb of *Surčin* and finally *Trešnja* (117 ha), 35 km away from the city at the foot of mount *Avala*⁶. Currently, there are over 250 hunting organizations in the country with over 80,000 registered hunters and the grounds cover a combined area of approximately 65,000 hectares. In addition to providing habitat for native wildlife species which thrive in urban and peri-urban areas, hunting organizations also breed wildlife on the grounds. Many hunting areas are fenced, but freely accessible hunting grounds also exist, as many are integrated into the landscape surrounding Belgrade's peri-urban settlements and at times even incorporate agricultural plots, while meadows

⁴ https://serbianoutdoor.com/wp-content/uploads/2012/08/reigstar_zasticenih_dobara_cirilica.pdf

⁵ [Lovacskisavezsrbije.rs](http://lovacskisavezsrbije.rs)

⁶ Srbijasume.rs/en/lovstvo/lovista

on the grounds may be used to harvest hay or as pastures by local farmers. As interactions between native and bred wildlife with domestic animals and humans are possible under these conditions, as well as contact between wildlife and human food and/or animal feed, transmission dynamics which allow exchange of parasite species are created. Specifically, the opportunity for sylvatically circulating species of microorganisms to transition into the domestic cycle is provided, which raises public health concerns.

Collecting samples from plants, soil and water

Water and soil samples will be obtained strictly from sites which are not under any governmental protection (whether as natural sites or as surface and/or ground drinking water sources). No water samples will be collected from areas designated as drinking water reservoirs, either surface or ground. Sampling will occur only on sites with easy public access. Water will be collected in clean plastic containers which have previously only held drinking water and have no chemical residues originating from any of the SRO laboratories.

Soil samples will be collected from agricultural plots and surrounding areas. To sample soil within hunting grounds, permission will be sought from the Hunters association. Soil may be sampled from participating stakeholders' plots only by permission. Collection of up to 200 g of soil will occur using clean nitrile gloves in a grid pattern and the soil will be stored in clean, sterile plastic containers (consumables accounted for in project budget). Care will be taken to avoid collection of any macroscopic ground dwelling insects and/or larvae, worms. Soil will not be collected from any plots covered in manure at the time of sampling. Information regarding any chemical treatment of the plots will be obtained from the participating stakeholders. Freshly treated plots will not be sampled.

Only cultivated food plants (leafy vegetables predominantly) and feed/fodder (alfalfa, barley) will be collected. None of project work regarding sampling will be disruptive for the farmers. Samples will be preferentially bought at green markets (farmer's markets) within the city of Belgrade, but may also be collected from fields with permission of participating stakeholders.

*

All sampling procedures and field work will be in concordance with the relevant laws and/or specific rulebooks. Field work will be conducted outside protected natural areas, to ensure that no protected flora or fauna will be disturbed by the project team. No sample collection will occur near private homes, residential areas, children's playgrounds and homes for the elderly. A company car will be used for transport; the car will not be driven through any natural terrain; natural terrain will be accessed exclusively on foot by the project team. No analytical methods, equipment which generates noise, or aerosols will be used while in the field. All analytical methods will be conducted inside the laboratory using existing and project specific occupational health and safety, biosafety and hazardous chemical safety training SOPs and proper PPE.

Potential impact of generated waste

Solid waste of non-biological origin which the project will generate will include plastic consumables, packaging and paper. All such waste will be disposed of according to the waste management plans and existing rulebooks, contracts, collection receptacles at each SRO. Potentially infectious solid waste (tissues, feces, carcasses) will be chemically (10% sodium hypochlorite solution) and/or physically inactivated (freezing prior or after processing and autoclaving after processing) prior to discarding in labeled biohazard bags in accordance with

the waste management plans and contracts with medical, pharmaceutical and animal waste removal companies at the lead SRO. Inactivation renders such waste non-infectious and safe for storage prior to pick up by the designated contractors. All inactivation procedures are validated scientific practice commonly used in laboratories. Liquid waste without hazardous chemicals (spent cell growth media, buffers, saline) from tissue culture which may contain cells (cell line) and/or infectious materials will be collected in plastic flasks/bottles and chemically inactivated using sodium hypochlorite at a final concentration of 10%. As the solution will be mostly aqueous, the chemical stability of sodium hypochlorite is expected to last for approximately 24 h, which is well within the contact time necessary to inactivate cells and parasites, after which the solution can be safely discarded in the laboratory drains. Liquid waste with potentially hazardous chemicals will be stored in glass bottles inside the fume hoods until pickup and disposal by contracted company at the lead SRO. Specific types of waste generated by this project also include surface water samples, which will be filtered using a 1 micron pore diameter filter to remove cysts and oocysts of protozoa, which will be processed further, while the water will be directly discarded into the laboratory drain at the lead SRO. Soil sample fractions which contain large particles of debris and cannot be processed by flotation/sedimentation will be discarded in regular trash immediately after sifting, while the remaining soil will be discarded after flotation/sedimentation as hazardous chemical waste according to waste management plans and existing contract at the lead SRO as ZnCl₂ is toxic to aquatic organisms. Solutions containing ethidium bromide (electrophoresis buffer) will be filtered using activated charcoal filters to remove EtBr prior to discarding in the laboratory drain. Agarose gels will be exposed to UV light for several days prior to discarding in hazardous waste bags and pickup by the said hazardous chemical waste contractor.

Expected quantities of chemicals waste are: for organic waste after Trizol treatment, the maximum expected quantities discarded are up to 3 litres for the whole duration of the project (3 years); for zinc chloride solution, the maximum expected quantities discarded are up to 6 litres for 3 years. SROs have contracts with entities registered for medical and hazardous chemical waste removal.

The project will test tissues of domestic animal which were raised in the peri-urban area of Belgrade and deprived of life or slaughtered for commercial use and thus are not subject to ethical approval (Animal Welfare Act, Official Gazette RS 41/2009, and Regulation on animal experimentation, Official Gazette RS 39/2010) and will be available from slaughterhouses/abattoirs and/or family farms either by permission of participating stakeholder and/or via direct purchase (as the anticipated total cost is below the one necessitating public procurement) by the project at green markets in Belgrade. Wild animal samples will originate only from hunting grounds and carcasses of species which were legally hunted during hunting seasons, by licensed hunters, both of which are ensured by the rules and regulations of local hunting organizations and relevant legislation.

Expected amount of tissues, both from domestic and wild animals cannot be specified (due to different species sampled) but based on the sample number will probably be in the range of 50-70 kg, for the whole duration of the project (3 years).

Waste management will be in concordance with the relevant laws and/or management strategies of the Republic of Serbia, including specific rulebooks.

Potential impact of working in laboratories

All laboratory work (including biosafety measures) will be in concordance with the relevant laws and/or management strategies of the Republic of Serbia, including specific rulebooks.

For handling of biological materials there are, measures, SOPs, PPE, knowledge on biosafety and training, which all help in preventing and most importantly avoiding infection. Not all biological materials handled in this project are truly infectious but will be treated as such, thus potential risks have been identified and mitigated, as stated in this document. In addition, all SROs have Rulebooks and Risk assessment acts related to our field of work, which will be adhered to.

Potential impact on the health and safety

Joint potentially adverse impact and risks on workers and community health and safety

As this project involves the collection and processing of animal tissues and environmental matrices, the primary associated biosafety risk is exposure to microorganisms (including spores) and potential for infection, as well as to any toxins which may be produced by certain species of microorganisms. As monitoring the presence of these potential risks is not practical and beyond the scope of this project, their presence will be presumed but not evaluated.

Presumption of infectivity of any human/animal derived samples is routine laboratory practice. The project team will therefore consider all samples as potentially infectious and handle them according to their existing training, special project related training, manuals and SOPs and using the appropriate PPE. Exposure may occur during necropsy (high risk), sampling (low risk) and/or processing (low risk). The greatest risk represents wildlife necropsy and organ extraction, while a certain risk is associated with the handling and processing of wildlife tissues and feces. Domestic animal tissues will be sourced from abattoirs/slaughterhouses while fish will be sourced from fishmongers/fish markets and thus the risk is associated only with processing. The biosafety risk of exposure associated with domestic animal tissues is low, as is the risk from fish tissues. The exposure risk from sampling, handling and processing water, soil and plant samples is minor. Among the microorganisms of highest concern are pathogenic bacteria such as *Salmonella* spp., *Listeria monocytogenes*, various strains of *Escherichia coli* and Enterobacteriaceae which may be present in high quantities in intestines and feces and lower quantities in water, on vegetables and in soil and can be transmitted by accidental ingestion and extraordinarily via contact with mucosa (eyes). While the prevalence of infection with *Salmonella* spp. and *Listeria* spp. among animals is variable, they are frequent surface contaminants in slaughterhouses and/or abattoirs. Specific pathogens of low prevalence in the Belgrade area, but of high risk due to the possibility of airborne transmission include *Francisella tularensis*, *Coxiella burnetii*, *Burkholderia mallei* and *Bacillus anthracis* spores.

The risk of infection with bloodborne species is deemed to be low, as the project team are already trained, proper PPE and additional training will be provided. The senior members of the project team are experienced in handling bloodborne pathogens. In addition to bacteria, airborne viruses are of high concern and include Avian influenza and Hantaan; as outlined in the mitigation plan table, the team will strictly adhere to the information from the Veterinary Directorate of Serbia (the relevant authority) and only wild birds from localities outside of the registered Avian influenza outbreak zone will be sampled. Rodent carcasses will be collected from exterminators. Among parasite species, the highest concern represents *Echinococcus*

multilocularis for which the golden jackal are definitive hosts with a reported prevalence of 14%. Eggs of the parasite are infectious upon ingestion and may be found in golden jackal intestines and feces (high quantity), water, vegetables and soil (low quantity). A very minor risk of infection is possible due to the presence of other zoonotic species of parasites in tissues (*Toxoplasma gondii*), and/or feces (*Giardia duodenalis*, *Cryptosporidium* spp.) without prior chemical and/or physical inactivation during tasks such as viability estimation and isolation in culture. All are transmitted by ingestion, *T. gondii* may also be exceptionally transmitted by needle stick.

Potentially adverse impact and risks on workers' health and safety

All team members are employees of accredited SROs obligated to follow national Law on Occupational Health and Safety and other legal documents concordant with occupational safety, including the training of the project team. General work in laboratories are in accordance with legal requirements listed above under subtitle of Legal and Institution Framework. Throughout the various stages of project execution and activities (such as laboratory and pilot work), researchers will undergo training in occupational health and safety. They will be acquainted with precautionary measures outlined in the Safety Data Sheets of chemicals and will be provided with personal protective equipment.

Potentially adverse impact and risks on community health and safety

Each individual participating in the sampling process will receive information, instructions, and procedures regarding the preparation, stay, and work at the sampling sites. This includes guidance on the use of personal protective equipment. Safety of fishermen during sampling will be the responsibility of the fishermen themselves and will be defined by the contract.

Scenario involving pathogenic bacteria such as *Salmonella* spp., *Listeria monocytogenes*, or various strains of *Escherichia coli* spreading beyond the laboratory, is a 'non-issue', as these bacteria are common contaminants of raw meat, and may be found in every kitchen and/or butcher shop. None of the mentioned microorganisms are infectious by contact or air. Thus, spreading of these microorganisms beyond the laboratory is not an issue, and is not related to this project. Also, all precautions to prevent infection while processing samples in the lab have been taken and proper PPE, which is the only measure (along with proper washing of hands, as is done in the household) applicable in this case, will be provided and worn by the team members.

Potential social impact

The stakeholders of PARASITE_HUNTER includes the professional food producers (vegetable and animal farmers) and food providers (fishermen, hunters and wildlife managers). The target population among the food producers are those who engage in 'family farming', a category which has been estimated to produce as much as 80% of the world's food, while smallholders among them are estimated to produce nearly a third of the world's food⁷. PARASITE_HUNTER aims to engage with small family farms which raise free-range animals and grow vegetables outdoors in the urban and peri-urban area of Belgrade.

Positive impact

The goal of this project is to improve public health by investigating possible transmission routes of food and waterborne parasites from farm and/or forest to fork. The aim is to recruit stakeholders for collaboration on the project from the communities within the sampling area, thus project activities and findings are expected to be disseminated through the communities by word-of-mouth and through planned stakeholder communication activities, which include

⁷ Ricciardi et al., 2018

interviews with collaborating stakeholders as well as discussions. All stakeholder communication activities involve only stakeholders who have agreed by signed consent to participate in project realization. As part of the communication activities, the project team will raise awareness regarding food and waterborne parasitic diseases as well as diagnosis, treatment and prevention options for both people and animals (domestic and companion animals). The team will provide scientific information as well as project generated results to the stakeholders through presentations, talks and leaflets. The project team will also work with collaborating stakeholders on improving and innovating on existing practices in food production in order to make food safer for the community as well as themselves. All of these activities are expected to raise the level of current stakeholder knowledge and promote adoption of prevention measures which should ultimately reduce the risk of acquiring food and waterborne parasitic diseases.

As the project team aims to interact with stakeholders during project realization, to mitigate any possible adverse impacts, the project team includes a trained psychologist. The stakeholders with whom the project team wishes to establish communication and cooperation, will be identified through online searches of farmer's cooperative websites and/or personal commercial websites and contacted only using publicly available information posted on the sites. The project goals will be explained in detail and interested stakeholders will be asked to participate in project realization primarily through answering questionnaires. No personal information will be collected and participating stakeholders will be asked to sign a consent form. A questionnaire will be administered online to volunteers among the stakeholders to assess their knowledge and attitude regarding parasites and food safety. The questionnaire study has already received ethical approval. As noted, this activity is covered by ethics screening and assessment.

Negative impact

Negative stakeholder response on findings of parasites in food is in the sphere of FEELINGS of concern or worry when a person/stakeholder just HEARS that there might be parasites in the food they eat/produce. Project will only make stakeholders aware of parasites. Grievance mechanisms exist for people to complain about implementation or adverse actions which disturb their regular lives, and not to available knowledge to express concern on possible findings of the project. If at all necessary, the SAIGE Grievance mechanism is in place [according to chapter 10.2 of the Serbia accelerating innovation and growth entrepreneurship (SAIGE) project ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK] and may be used by any affected party; appropriate information on how to use the mechanism will be provided to our stakeholders.

All other potential social impact is covered by ethics. As project is with low risk as the result of separate ethics screening, no related monitoring is recommended during the project implementation.

SUMMARY OF ENVIRONMENTAL AND SOCIAL IMPACT

The scientific community at large will benefit from this project from the results and findings, which will cover existing knowledge gaps and provide data for future studies. The local scientific communities at the participating SROs will additionally benefit from the project acquired equipment, which will facilitate fast and uniform sample processing, thus raising the quality of the data. In addition, the equipment is an investment into raising the capacity of the Center of Excellence for Food and Vector borne Zoonoses at the lead SRO to work with environmental matrices and provide detection/identification services in the future. The methodology applied in various tasks of this project

is diverse and aims to transfer knowledge and skills of the senior team members to the team's trainees (PhD students) as part of building their scientific capacity. Specifically, visual parasite identification by microscopy is a dying art which this project aims to retain in the scientific community by training PhD students.

The project management strategy has been designed to emphasize project specific training, proficiency testing, working strictly according to SOPs and the maintenance of records and documents, including monitoring plans for every task. This management strategy's emphasis is on enabling the project team to work safely and comfortably with potentially infectious and/or hazardous materials, standardization to ensure reproducibility and quality of the data, traceability to help identify potential omissions and help with troubleshooting and continuous monitoring to ensure timely revisions/updates and avoid errors during implementation of the project. As the management strategy will affect the entire project team, it will provide a framework for future collaborations.

Review of the impact on the environment that are predicted for the duration of the project is listed below.

- **Population:** Low.
- **Working in the field:** The consequential impact is moderate. and related **Health and Safety.** Appropriate mitigation and monitoring measures during the project implementation are planned. Private property will not be entered unless it is the one of a collaborating stakeholder and covered by cooperation agreement.
- **Social:** Low
- **Geology and soil:** Low.
- **Climatic characteristics:** Low
- **Seismology:** Low.
- **Air quality:** Low. The project team will travel to sites for sample collection, scouting and setting traps as well as collaring animals using a company vehicle. The routes will be planned to accomplish as many tasks as possible within one trip and only one company car will be used to transport the project team and samples. As the project will be realized in the urban and peri-urban area of Belgrade where vehicles are common, the additional emissions by one car are considered negligible
- **Working in the laboratory including Life and Fire Safety:** Moderate
- **Waste:** Low/Moderate, well controlled and managed
- **Water resources:** Low
- **Soil:** Low
- **Flora and Fauna:** Low.
- **Noise:** Low.
- **Cultural heritage:** Low.

The consequential cumulative environmental and social impact is moderate.

MITIGATION PLAN

Phase	Issue	Mitigating Measure	Cost of Mitigation (If substantial)	Responsibility	Monitoring
<i>Project preparation</i>	Life and fire safety (LFS) procedures in laboratory	All researchers are familiar with the current Evacuation Plan and Protection and Rescue Plan, with the dangers of fire and fire protection measures and are trained in handling fire extinguishers, hydrants and other devices used for extinguishing fires by the Law, as well as with the "Instructions for action in case of fire".	None anticipated	Participating SRO's	SF/PIU
	Waste management	Review of existing contracts with waste management companies to assess whether the needs of the project are met by existing contract provisions/ duration Creation of annexes or new contracts.	None anticipated	Project PI; leading SRO's legal officer [lead SRO=IMI; during Month 1]	SF/PIU
	SOPs for field work; sample collection and processing; isolation and in vitro culture; molecular detection and identification; viability analyses; flotation and sedimentation; and laboratory safety and emergency procedures	Review of existing SRO rulebooks/policy and adaptation to specific project needs to ensure health and safety of the project team.	None	Project PI [all SROs: IMI, FBUB, UBFZF, UNSFA, INMES; during Month 1]	SF/PIU
	Personal protective equipment (PPE)	For sample collection which occurs in the field, the project team will be outfitted with PPE which will consist of: Rubber boots, latex gloves, headlamps and/or torches, portable first aid kits. Laboratory work PPE will consist of: lab coats, latex gloves, eye protection (goggles).	All necessary PPE has been accounted for in the project budget. [IMI, FBUB, INMES; during Month 2]	Project PI	SF/PIU
	Contact with stakeholders (family farmers, homesteaders, hunters, fishermen)	Establishing contact with stakeholders and offer participation and collaboration on the project. Using only publicly available means of contacting stakeholders. Only adults will	None	Project PI [all SROs: IMI, FBUB, UBFZF,	SF/PIU

		be considered eligible for communication. Creation of anonymized expression of interest and consent forms.		UNSFSA, INMES; during Month 2]	
	Updating laboratory competence training with project specific training.	Training of the project team in the methodology will be administered by the most experienced team members prior to the start of the project activities, while regular refresher training will be administered during the project lifetime at a 6-month interval. Proficiency testing prior to commencement of work will be administered. The initial training is expected to include hands-on work at the laboratory bench within the SRO which will be responsible for each task described in the work packages, while refresher training will occur at meetings and consist of short visual presentations on each topic followed by discussion. Manuals and SOPs will be provided to the project team.	None	Project PI [IMI; during Month 1]	SF/PIU
	Official work related travel coverage during field work	Field work will be scheduled with the PI and/or WP leaders via written request. Upon signature of the PI, the team members will obtain official travel orders from the participating SROs.	None	Project PI [IMI, FBUB, INMES; during Months 3-34]	SF/PIU
	Questionnaire study for participating stakeholders	Anonymized questionnaires will be created by a trained psychologist and administered through an online platform. Completion should take no more than 20 min. The purpose of the study and questions will be stated in brief in the questionnaire. Questions will focus solely on food safety knowledge and opinions and will not investigate	None	Project PI [IMI, UBFZF; during Month 2]	SF/PIU

		topics which may be deemed sensitive, such as sexual orientation, behavioral issues, traumatic experiences, ethnicity, or religious beliefs. None of the questions are expected to trigger emotional or psychological distress or trauma.			
<i>Project implementation</i>	Storage of consent forms and questionnaires	The consent forms will be stored in the lead SRO's laboratory inside a locked cabinet. Questionnaires will be stored temporarily in the Google cloud space provided by Firebase and will be accessible solely by the project team. Although no personal information will be collected in the questionnaires, Firebase has been selected as utilizes and complies with GDPR security standards to ensure that no data can be accessed by unauthorized persons. After the study period, the data will be extracted and stored on personal computers for statistical analyses.	None	Project PI [IMI; during Month 2-34]	SF/PIU
	Air pollution	One car will be used to visit multiple sites by all project members (carpooling).	None	Project PI [FBUB; during Month 3-34]	SF/PIU
	Collaboration with the Hunters Association of Serbia	Contacting the Hunters Association of Serbia with collaboration request outlining specific needs/requirement of the project regarding permits for access, sample collection, trapping within hunting grounds. Signing of collaboration agreement.	None	WP7 leader, project PI [IMI, FBUB; during Month 3]	SF/PIU
	The existence of several sites under various levels of governmental protection in the sampling area.	All sampling will occur outside of government protected areas.	None	Project PI [IMI; during Month 3-34]	SF/PIU

Sampling water and crustaceans	Surface water samples will be collected from sites with easy public access in clean 5 L containers (10 L total). Water samples may be taken from rivers directly, ponds, irrigation canals but will not be collected from private land and or areas with drinking water reservoirs. Brachiopods and copepods will be caught in sterile nets from surface water sources.	None	WP3 leader, project PI [IMI, FBUB; during Month 5-34]	SF/PIU
Cross-contamination of water sources with aquatic small fauna or microorganisms.	Sterile nets will be used for each water source to avoid cross contamination. Net sterilization will occur at the laboratories located at the Faculty of Biology and never in the field. Nets will be chemically sterilized with 70% ethanol, rinsed in clean distilled water and then exposed to a laboratory germicidal UV lamp for at least 30 min. To ensure that nets are sterile and chemical residue free, the procedure will be tested prior to sampling and an optimal procedure will be defined.	None	WP3 leader, project PI [IMI, FBUB; during Month 5-34]	SF/PIU
Veterinarian assistance	A veterinarian with training and experience in wildlife handling will be subcontracted by the project to assist the project team. He/she will be responsible for approaching and sedating captured animals, initial health check and assistance during collar fitting, transferring into a suitable holding cage (intended to provide a safe enclosure for the animal to recover from sedation) and administering the anti-sedative. This study has received all relevant ethical board permissions. The veterinarian's contract will stipulate	None	Project PI [IMI; during Month 2]	SF/PIU

		responsibilities and/or relevant experience with approaching and sedating wild canids, evaluating their health status, and performing necropsy.			
	Trapping golden jackals and permits.	Animals will be trapped exclusively within registered hunting grounds and local trapping permits will be obtained via a collaboration agreement through the Hunters Association. Individual hunting organizations will be contacted by the hunter's liaison of the project team to obtain information regarding local conditions and make arrangements regarding access to sites for wildlife camera and trap deployment. Trapping will occur only at sites which are suitable for camera and trap deployment but away from trails, roads and other access points. Note: related ethics issues are covered by ethics and Etic Approvals, already obtained	None	WP7 leader, project PI [IMI,FBUB; during Month 6-24]	SF/PIU
	Trapping golden jackals and avoiding non target species.	Each trapping site and trap will be monitored by wildlife cameras which will be set up by the project team during the location scouting phase of the project. Cameras are motion-activated, and will be aimed at the ground to monitor trap activation. The decision on setting the traps will be made after analysis of the camera footage taking into account any human and/or domestic animal presence and with the clear objective of avoiding setting traps in areas of frequent foot traffic. As the traps are weight-activated, the camera footage will be used along	All necessary costs have been accounted for in the project budget.	WP7 leader, subcontracted veterinarian (to be hired), project PI [IMI,FBUB; during Month 6-24]	SF/PIU

	with relevant prior knowledge to evaluate the average weight limit for the traps in order to avoid springing by other animal species and/or juvenile golden jackals. Once the decision has been made, the local administrator of the hunting grounds will be informed regarding the location of the traps. The cameras will remain in place to continuously monitor the traps. Note: related ethics issues are covered by ethics and Etic Approvals, already obtained			
Wildlife camera footage of human presence.	Identification of humans will not be possible, since the camera will not capture images at a height greater than 50 cm from ground level (i.e., only footage of shoes/boots will be captured).	None	WP7 leader, project PI [IMI, FBUB; during Month 6-24]	SF/PIU
Hazardous terrain in the field	Potentially hazardous terrain will be identified via information from hunting organizations and during scouting trips by the project team. Hazardous terrain will be entirely excluded from field work to ensure safety of the project team.	None	Project PI [IMI; during Month 3-34]	SF/PIU
Infectious waste	The mitigation of potentially infectious waste will be the inactivation of such waste by freezing, chemical inactivation and autoclaving prior to pick-up and disposal according to waste management plans and contracts	None	Project PI [IMI, FBUB; during Month 3-34]	SF/PIU
Carcass waste	To mitigate carcass waste, already extracted domestic and wildlife samples will be acquired/purchased when possible, and remains will be disposed of by contracted company.	None	Project PI [IMI, FBUB; during Month 3-34]	SF/PIU

Project specific chemical waste	To mitigate the impact of chemical waste, all hazardous chemicals will be collected and stored in fume hoods until disposal according to waste management plans and contract, while activated charcoal filtration will be used to remove certain chemicals whenever possible prior to discarding. The activated charcoal will be stored in a sealed container until disposal by contracted company	None	Project PI [IMI; during Month 3-35]	SF/PIU
Handling of biological materials.	All materials will be presumed to present an infection risk (“presumption of infectivity”). This is a standard practice in healthcare and research laboratories. All team members are trained, and adherence to all SOPs is mandatory (with emergency preparedness plan included)	None	Project PI [IMI, FBUB, UNSFA; during Month 3-35]	SF/PIU
Handling of potentially hazardous chemical materials.	All team members are trained to use potentially hazardous chemicals during routine laboratory work and refresher project specific training will be provided along with PPE. Adherence to all SOPs is mandatory. All chemicals will be handled using appropriate PPE (goggles, laboratory coat, nitrile gloves). Solutions containing volatile and/or irritant chemicals will be prepared inside fume hoods. All chemicals will be stored in appropriate fire-proof chemical storage cabinets in the laboratories or in fume hoods. The potentially hazardous chemical reagent is Trizol, which contains guanidine hydrochloride and phenol and will be used frequently for nucleic acids extraction (1 mL per sample), as well as	None (PPE already budgeted within the project).	Project PI [IMI, FBUB; during Month 3-35]	SF/PIU

		chloroform (only 0.2 mL per sample). Other relevant chemicals include ZnCl, which will be used to prepare a flotation solution, various stains/dyes, alcohols (ethanol and isopropanol) and sodium hypochlorite.			
	Performing wildlife necropsy.	To minimize the risk associated with wildlife necropsy, wildlife tissues will be obtained from hunting organizations whenever possible, as many hunting organizations process wildlife carcasses on hunting grounds for commercialization.	None	WP7 leader, subcontracted veterinarian (to be hired), project PI [IMI, FBUB; during Month 3-34]	SF/PIU
	Potential biosafety issues associated specifically with wildlife necropsy.	Necropsy will be done by the most experienced team members and a subcontracted veterinarian, in a dedicated necropsy space, using PPE which consists of: protective eyewear, rubber gloves, N95 mask, laboratory coat. For that purpose, carcasses will be collected from hunting organizations, transported inside biohazard bags in coolers to the laboratory where the necropsy will be performed. Tissues of interest will be collected using sterile surgical instruments and placed in airtight plastic containers/bags. After collection, they may be transported to another SRO or processed further on site. The remaining carcass will be placed in an autoclavable biohazard bag, the working surfaces will be dowsed with a 10% sodium hypochlorite solution with at least 30 min contact time and thereafter rinsed with distilled water. The dissection instruments will be wiped down with dry	None	WP7 leader, subcontracted veterinarian (to be hired), project PI [IMI, FBUB; during Month 3-34]	SF/PIU

		paper towels and thereafter dipped in 10% sodium hypochlorite for 10 min, rinsed with distilled water and sterilized in a water-bath at 100 °C for 20 min. The used PPE along with paper towels used to clean the surfaces will be collected in autoclavable biohazard bags and autoclaved. Bioindicators will be used to ensure adequate inactivation.			
Potential biosafety issues associated with animal tissue processing		The PPE for tissue processing will include: protective eyewear, nitrile gloves and laboratory coat. Whenever possible, tissue processing such as opening/sectioning will occur in petri dishes, for small animal species, or in plastic trays lined with tissue paper for larger animal species. Once the samples have been processed, plastic trays will be sprayed with 10% sodium hypochlorite for disinfection, while tissue paper and petri dishes will be placed inside autoclavable biohazard bags and autoclaved. Bioindicators will be used to ensure adequate inactivation.	None	Project PI [IMI, FBUB; during Month 3-34]	SF/PIU
Presence of <i>Echinococcus multilocularis</i> in golden jackal intestines/feces		As intestines and feces of golden jackals represent a biosafety risk, due to the extended handling/processing time required, they will be frozen for at least three days at -80°C, as outlined in the project proposal, as this is a published, validated protocol to render the eggs non-infectious (“WHO/OIE Manual on echinococcosis in humans and animals”, at: https://www.who.int/publications/i/item/929044522X)	None	WP7 leader, subcontracted veterinarian (to be hired), project PI [IMI, FBUB; during Month 6-24]	SF/PIU

<p>Presence of Avian influenza registered outbreak zones within sampling area</p>	<p>Information on current outbreak zones of Avian influenza as monitored by the Veterinary Directorate of Serbia will be obtained from the official website of the Veterinary Directorate and/or via request for information via e-mail. Only wild birds from localities outside of the registered outbreak zone will be sampled.</p>	<p>None</p>	<p>Project PI [IMI; during Month 3-35]</p>	<p>SF/PIU</p>
<p>Solid waste reduction in laboratory</p>	<p>The environmental impact of the solid waste of non-biological origin generated by this project will be mitigated by selecting refills rather than new packaging of as many consumables as possible within the limitations/regulations imposed by the requirement for public procurement. A number of consumables, in particular containers and bottles, will be replaced with glass whenever possible and feasible.</p>	<p>None</p>	<p>Project PI [IMI, FBUB; during Month 2-34]</p>	<p>SF/PIU</p>
<p>Negative stakeholder response on findings of parasites in food.</p>	<p>Communication with stakeholders will be done by a trained psychologist. Designated stakeholder liaisons within project team with relevant experience in particular research areas (agriculture, animal breeding/farming, hunting and fishing and wildlife management) will be available to explain and clarify the findings to stakeholders as well as respond to any questions/issues during project realization. The project team will work with participating stakeholders to improve and innovate existing practices in food production to elevate food safety. If needed, SAIGE grievance mechanism will apply.</p>	<p>None</p>	<p>WP8 leader; project PI [IMI, UBFZF; during Month 14-35]</p>	<p>SF/PIU</p>

		Note: The grievance mechanism is in place from Month 1-36.			
	Extent of stakeholder knowledge on food safety and public health	Possible transmission routes of food and waterborne parasites from farm and/or forest to fork will be investigated and findings conveyed to stakeholders.	None	WP8 leader; project PI [IMI, UBFZF; during Month 33-35]	SF/PIU

MONITORING PLAN

Phase		What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored / type of monitoring equipment?	When is the parameter to be monitored / frequency of measurement or continuous?	Monitoring cost: What is the cost of equipment or contractor charges to perform monitoring?	Responsibility	Monitoring
<i>Project preparation</i>		Duration and provisions of contracts with waste removal companies.	SRO laboratories	Laboratory/on-site visual assessment of contracts with waste removal companies.	Once, prior to commencing work.	None	Project PI monitors and reports to the SF	SF/PIU
		Created SOP documents and training manuals.	SRO laboratories; internal cloud.	Laboratory/on-site visual assessment and checks of dated and signed documentation.	Once, prior to commencing work.	None	Project PI monitors and reports to the SF	SF/PIU
		Prepared stakeholder consent forms for stakeholder's participation	Leading SRO laboratory / office.	Laboratory/on-site visual assessment of forms.	Once, prior to commencing work.	None	Project PI monitors and reports to the SF	SF/PIU
		Prepared collaboration agreement with	Lead SRO	Visual assessment of the signed agreement.	Once, prior to project realization	None	Project PI monitors and reports to the SF	SF/PIU

	Hunters Association of Serbia						
	Agreements with abattoirs which process free-range meat animals.	Participating SRO (INMES)	Visual assessment of the signed agreement.	Once, prior to project realization	None	Project PI monitors and reports to the SF	SF/PIU
	Training manuals and proficiency test created.	Lead SRO laboratories.	Laboratory/on-site visual assessment of manuals and test.	Once, prior and once after completion of training and prior to execution of WPs.	None	Project PI monitors and reports to the SF	SF/PIU
<i>Project implementation</i>	Proficiency test evaluation.	Lead SRO laboratories.	Laboratory/on-site visual assessment of test performance checklist.	Once, after creation of proficiency test and prior to execution of WPs.	None	Project PI monitors and reports to the SF	SF/PIU
	Health insurance coverage during field trips	Participating SROs administrative offices	Laboratory/on-site visual assessment and checks of signed travel orders.	Prior to each field trip.	None	Project PI monitors and reports to the SF	SF/PIU
	Air pollution	Participating SROs administrative offices	Company car use for field trips Laboratory/on-site visual assessment and checks of dated and signed travel orders.	Regularly, throughout project lifetime.	None	Project PI monitors and reports to the SF	SF/PIU
	Location access and trapping permits.	Leading SRO laboratory / office	Laboratory/on-site visual assessment and checks of cooperative agreement with the hunters association.	Regularly, throughout project lifetime.	None	Project PI monitors and reports to the SF	SF/PIU
	Potentially hazardous terrain during field work	In the field	Visual checks on site during scouting trips, adverse weather alerts, flooding or road blocks information from public services.	Regularly during scheduled trapping activities	None	Project PI monitors and reports to the SF	

Sampling outside protected areas or areas with registered avian influenza outbreaks.	Leading SRO laboratory / office (project documentation / archives).	Field trip travel orders; location GPS data.	Regularly, throughout project lifetime.	None	Project PI monitors and reports to the SF	SF/PIU
Sterility of sampling nets for crustaceans.	Lead SRO laboratory.	Data from experimental validation of sterilization protocols.	Once, prior to commencing sampling.	None	Project PI monitors and reports to the SF	SF/PIU
Targeted trapping of golden jackals	In the field; personal computers.	Wildlife camera footage.	Regularly, throughout project lifetime.	None	Project PI monitors and reports to the SF	SF/PIU
Inactivation of potentially infectious waste.	SRO laboratories.	Visual inspection of bioindicators.	Regularly, throughout project lifetime.	None (already budgeted).	Project PI monitors and reports to the SF	SF/PIU
Neutralization / deactivation and removal of chemical waste.	SRO administrative offices.	Invoices on waste pick-up and disposal.	Regularly, throughout project lifetime.	None	Project PI monitors and reports to the SF	SF/PIU
PPE	SRO laboratories and administrative offices.	Laboratory / on-site visual inspection; invoices.	Regularly, throughout project lifetime.	None	Project PI monitors and reports to the SF	SF/PIU
Stakeholder opinions, attitudes and knowledge toward project findings, food safety and public health	In the field.	Interview transcripts and minutes of discussions with participating stakeholders	Regularly, throughout project lifetime.	None	Project PI monitors and reports to the SF	SF/PIU

ESMP Prepared by



Ivana Klun, PI, 27/12/2023

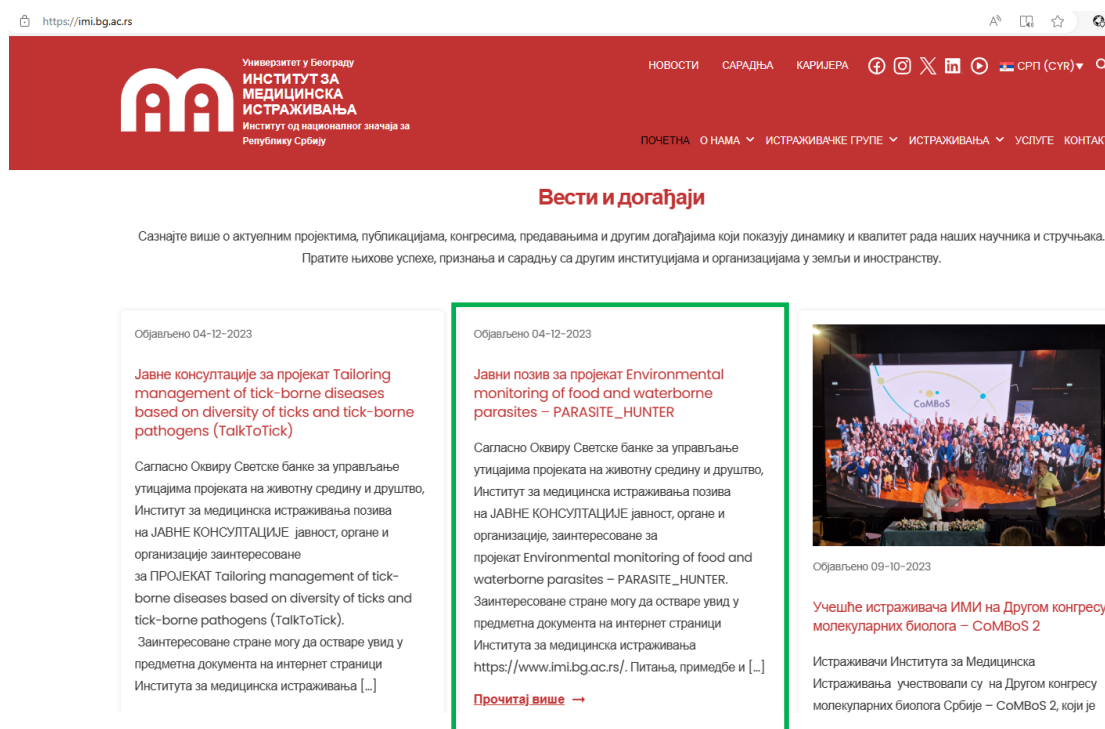
PUBLIC CONSULTATION DETAILS AND MINUTES OF MEETING FOR THE ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Introduction

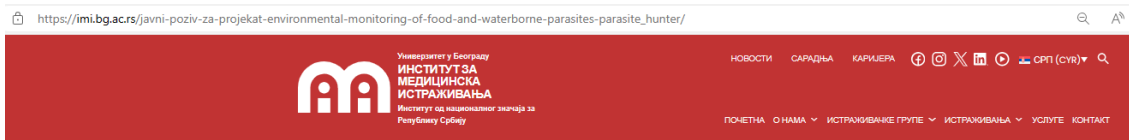
As required by WB Environmental and Social Standard 10 (ESS10) – Stakeholder Engagement and Information disclosure, during preparation of the Draft ESMP, part III, the Project team carried out public consultations for the PARASITE_HUNTER Project funded by the Science Fund of the Republic of Serbia in order to present potential environmental and social management issues related to the project to relevant experts and the general public.

1. Manner in which notification of the consultation was announced:

The notification of the consultation was announced by means of the lead SRO's website [Почетна - ИНСТИТУТ ЗА МЕДИЦИНСКА ИСТРАЖИВАЊА \(bg.ac.rs\)](https://imi.bg.ac.rs) ([Јавни позив за пројекат Environmental monitoring of food and waterborne parasites - PARASITE_HUNTER - ИНСТИТУТ ЗА МЕДИЦИНСКА ИСТРАЖИВАЊА \(bg.ac.rs\)](https://imi.bg.ac.rs)); it was posted on December 4, 2023, eight days prior to scheduling the meeting, along with the link to the draft ESMP document (Parts I&II, version approved by the World Bank). (The announcement was still online Dec 13, 2023). Screen shots of the announcement pages are included:



Screen shot 1: Announcement for Public consultation at the lead SRO in Belgrade, posted on December 4, 2023



Homepage / [Вести и порuke](#) / [Јавни позив](#) / [Јавни позив за пројекат Environmental monitoring of food and waterborne parasites – PARASITE_HUNTER](#)

Јавни позив за пројекат **Environmental monitoring of food and waterborne parasites – PARASITE_HUNTER**

Објављено 04-12-2023

Сагласно Оквиру Светске банке за управљање утицајима пројеката на животну средину и друштво, Институт за медицинска истраживања позива на **ЈАВНЕ КОНСУЛТАЦИЈЕ** јавност, органе и организације, заинтересоване за пројекат **Environmental monitoring of food and waterborne parasites – PARASITE_HUNTER**.

Заинтересоване стране могу да остваре увид у предметна документа на интернет страници Института за медицинска истраживања <https://www.imi.bg.ac.rs/>.

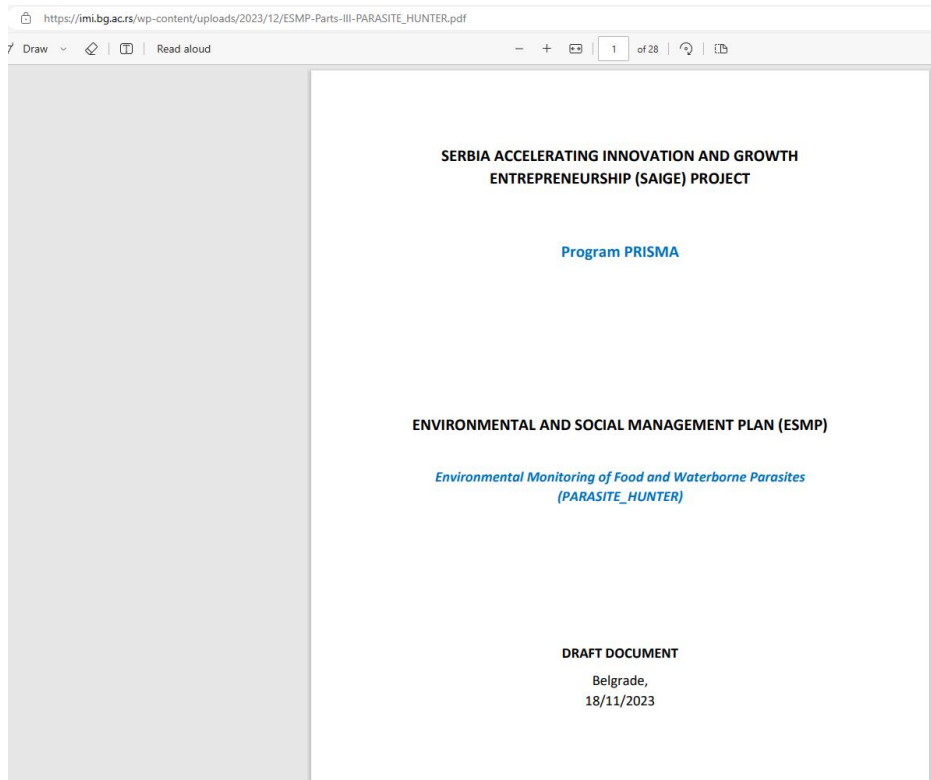
Питања, примедбе и сугестије у вези са предметном документацијом се подносе Институту за медицинска истраживања у писаном облику на адресу Др Суботића број 4, 11129 Београд, или електронском поштом на адресу: office@imi.bg.ac.rs са напоменом/предметом „За Јавне консултације за PARASITE_HUNTER“ најкасније до 11.12.2023. године до 16,00 часова.

Непосредне јавне консултације и презентација предметне документације одржаће се дана 12.12.2023. године у 17,00 часова у просторијама Библиотеке Института за медицинска истраживања у Београду, Булевар ослобођења број 18.

Пријаву за учешће на непосредним јавним консултацијама потребно је послати до 12.12.2023. године до 10,00 часова путем електронске поште на адресу: office@imi.bg.ac.rs.

Документ [можете погледати и преузети преко следећег линка](#)

Screen shot 2: Announcement for Public consultation at the lead SRO in Belgrade, posted on December 4, 2023



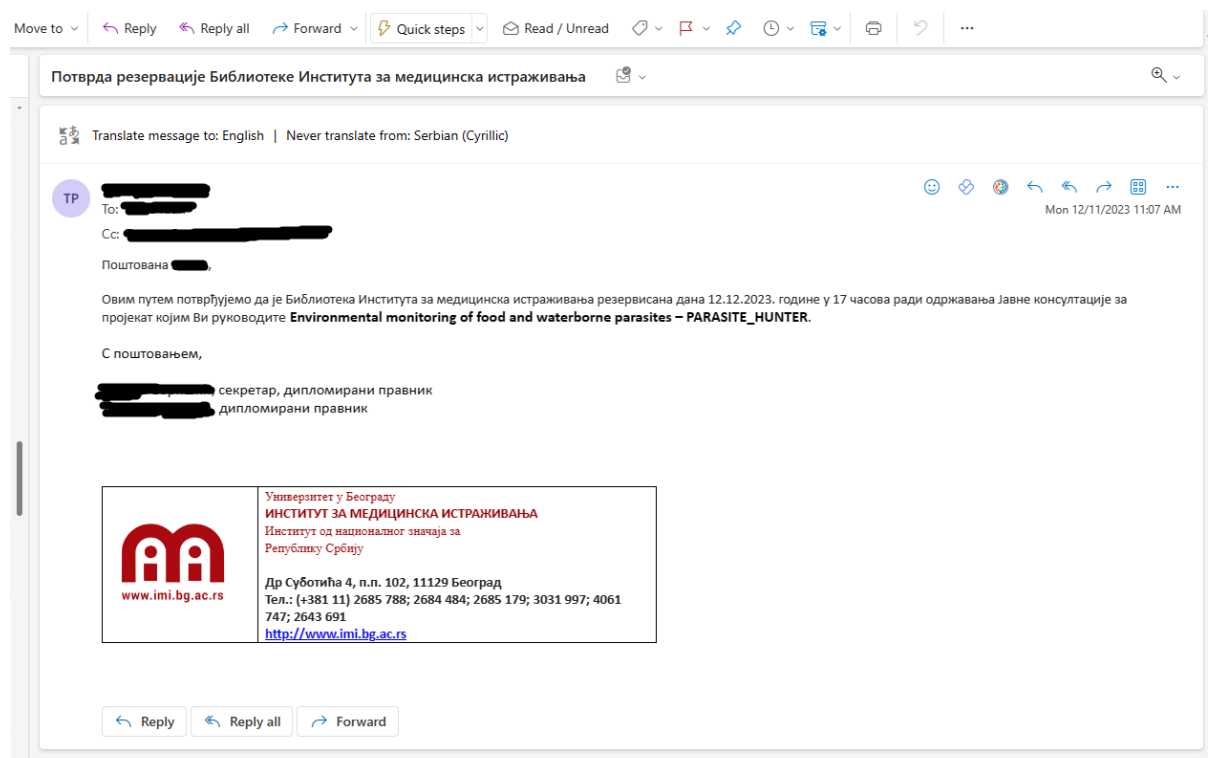
Screen shot 3: ESMP document posted on the lead SRO website on December 4, 2023

2. Date consultation was held

The public consultation was held on December 12, 2023, at 17:00.

3. Location consultation was held

Consultation was held at the Library of the lead SRO (Institute for Medical Research, University of Belgrade, ground floor, room number 67) at Bulevar oslobodjenja 18, Belgrade.



Screen shot 4: Library booking confirmation e-mail on scheduled date and time.

4. Who was specifically invited

In order to provide further awareness of the ESMP implications and significance for the project related activities and their potential influence on the ecosystem and wildlife, the following persons/organizations' representatives were specifically invited by personal communication:

- Project team members (TM1-10)
- Practicing veterinarians
- Professors at the Faculty of Veterinary Medicine
- Hunters Association of Serbia
- Professional environmental protection / risk assessment consultants
- PhD students from the Faculties of Veterinary Medicine and of Biology
- Colleagues from the Institute for Medical Research

All invitations were made on December 4, and the invited persons were asked to read the ESMP document in preparation for the meeting.

5. List of Attendees

In addition to 9 team members (PI, TM1, TM2, TM3, TM5, TM6, TM7, TM9, TM10), 10 invited stakeholder (S) and general public representatives were present.

A scan of the List of Attendees and the Meeting Agenda is included:

СПИСАК УЧЕСНИКА У ЈАВНОЈ РАСПРАВИ - ПРЕДСТАВЉАЊУ УСВОЈЕНОГ НАЦРТА ПЛАНА ЗА УПРАВЉАЊЕ УТИЦАЈИМА НА ЖИВОТНУ СРЕДИНУ И ДРУШТВЕНО ОКРУЖЕЊЕ ТОКОМ ПРОЈЕКТА

Environmental monitoring of food and waterborne parasites (Мониторинг паразита преношених храном и водом у животној средини) - PARASITE_HUNTER



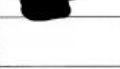
Уторак 12/12/2023, 17⁰⁰, Библиотека Института за медицинска истраживања Универзитета у Београду, Булевар ослобођења 18

ДНЕВНИ РЕД:

- 1) **Руководилац пројекта PARASITE_HUNTER:** Увод у јавну расправу
- 2) **Члан пројектног тима, професор на одељењу за психологију Филозофског факултета УБ:** Жалбени механизам
- 3) Питања и одговори
- 4) Дискусија

Напомена: Учесници су сагласни да попуњавањем и парафирањем овог списка дају сагласност да се њихови уписани подаци, који су искључиво општег карактера, могу користити у сврхе састављања записника и извештаја Светској банци о току и садржају ове Јавне расправе.

Р. бр.	Назив организације у којој је учесник запослен (оставити празно ако је учесник физичко лице)	Позиција у орг. / звање и/или образовање, тј. струка учесника (за чланове тима пројекта навести и ознаку - нпр. TM1, TM2...)	Параф
1	BEOSIM UPRAVLJANJE RIZICIM d.o.o.	KONSULTANT ZA PRIVREDU	
2	Biološki fakultet, Univerzitet u Beogradu	asistent	
3	Биолошки факултет, Универзитет у Београду	НАУЧНИ САРАДНИК	
4	Ветеринарна амбуланта Српска	власник и доктор	
5	Ловачки савез Србије	самостални саветник	
6	Биолошки факултет	в. професор	
7	Филозофски факултет УБГ	УМРЕДНИ ПРОФЕСОР	
8	IMI	Научни сарадник млекар	
9	Biološki fakultet, Univerzitet u Beogradu	истраживач сарадник	
10	Biološki fakultet, Univerzitet u Beogradu	student	
11	Биолошки факултет, Универзитет у Београду	студент	
12	Факултет ветеринарске медицине	асистент	
13	Биолошки факултет	VAN PROF.	
14	Институт за мед. истраживања	НАУЧНИ САРАДНИК	
15	Biološki fakultet	истраживач сарадник	
16	Биолошки факултет	DOCENT	

Р. бр.	Назив организације у којој је учесник запослен (оставити празно ако је учесник физичко лице)	Позиција у орг. / звање и/или образовање, тј. струка учесника (за чланове тима пројекта навести и ознаку - нпр. ТМ1, ТМ2...)	Параф
17	ИММ	Н. сав. (PI)	
18	ИММ	Секретар Института	
19	Биолошки ФАКУЛТЕТ	ИСТРАЖИВАЧ САРАДНИК	
20			
21			

According to the numbered list, the attendees were:

1	Professional environmental protection / risk assessment consultant from the <i>Beosim upravljanje rizicima d.o.o.</i>
2	Teaching Assistant from the Faculty of Biology
3	Research Associate from the Faculty of Biology
4	Practicing veterinarian and owner of a veterinary practice (S)
5	Associate at the Hunters Association of Serbia (S)
6	TM1
7	TM2
8	TM5
9	Research Assistant from the Faculty of Biology
10	General public (Student from the Faculty of Biology)
11	General public (Student from the Faculty of Biology)
12	Teaching Assistant from the Faculty of Veterinary Medicine (S)
13	TM7
14	TM6
15	TM9
16	TM3
17	PI
18	Institute for Medical Research Secretary (Legal services)
19	TM10

6. Meeting Agenda

The following Meeting Agenda, in addition to being outlined during invitations to the attendees, was announced at the beginning of the meeting:

- 1) Introduction to Public consultations
- 2) Explanation of the mitigation measures specifically for social interactions, including the existing grievance mechanism
- 3) Questions and Answers
- 4) Discussion and Conclusion of the meeting



Picture 1: Public consultation at the lead SRO in Belgrade, 12 December 2023



Picture 2: Public consultation at the lead SRO in Belgrade, 12 December 2023

7. Summary Meeting Minutes (Comments, Questions and Response by Presenters)

The consultations started at 17:09; all listed attendees were present from the beginning. TM9 was asked to keep the minutes, and TM3 to take photos of the meeting.

The introduction to the consultation was done by the PI and included a prepared statement which was read to the attendees. The statement included an explanation of the purpose of the consultation and a short summary of the project goals, activities and tasks related to possible environmental and social risks. Also, waste management and existing waste management plans work safety related rulebooks at the participating SROs were mentioned and the attendees were informed that the Project team adheres to all SRO rules and regulations.

Next, TM2 introduced himself and his role as a trained psychologist in communicating with stakeholders and the general public, including mentioning a potential social impact of the project which is the planned questionnaire study and for which all ethical approvals have been granted. He underscored that the study will be conducted on a strictly voluntary basis and will not include any sensitive questions or collect any personal data. Finally, TM2 elaborated on the grievance mechanism available through the provisions of the SAIGE project and which is available to the general public.

The floor was then opened for questions by the PI.

Question no.1 (Q1): The representative of the Hunters Association of Serbia (HAS) asked if there is a way for the Association to contribute to seamless implementation of the Project, and which task can they be involved in.

Answer no.1 (A1): TM1 replied that the Project intends to sign a Collaboration Agreement with the Association to facilitate access to hunting grounds, sampling and the capture-collar-release study, and that any assistance is greatly appreciated.

The HAS representative replied that their members are very interested in supporting every project involving wildlife and that they would be happy to contribute in any way they can, including taking part in the questionnaire study.

Q2: The practicing veterinarian and owner of a veterinary practice inquired whether the study will require the assistance of a veterinarian in sample collection, and specifically, the capture of golden jackals.

A2: The PI replied that the Project indeed plans to hire a skilled veterinarian, with experience in wildlife handling as a subcontractor, and that an appropriate listing (tendering procedure applied) will be announced, most likely on the lead SROs website as well.

Q3: A Research Assistant from the Faculty of Biology asked if a collaboration is possible, in particular with regard to reuse or sharing of some of the collected animal tissue samples.

A3: The PI explained that collaborations must be approved prior to consideration primarily by the appropriate Ethical boards, and secondly, the proposed collaborating SROs, but pending these documents, that the Project is happy to facilitate research and collaborate with any interested party. Also, repurposing and sharing of samples aids in conservation as well as reducing waste of animal origin.

Q4: A Teaching Assistant from the Faculty of Biology asked if any of the parasite life stages can be found in animal species other than mammals, which were not specifically mentioned at the start of the meeting, such as amphibians for instance.

A4. The PI confirmed and explained that many species can indeed be either intermediate or accidental hosts of parasites, but that no protected species will be sampled, and that the Project team will not access any areas under natural protection.

Q5 (a Comment): The HAS representative stated that the official hunting seasons are strictly regulated, and that not all samples will be available throughout the calendar year.

A5: The PI and TM1 explained that this was taken into consideration when planning the Project activities.

Q6: A Research Associate from the Faculty of Biology asked if the Project will sample a small number of species of fish, if these will be *commercial fish species* or are other species under consideration as well.

A6: The PI explained that the Project will adhere to the existing laws of the Republic of Serbia which state that commercially fished species are exempt from Ethical Approval and as the Project is concerned with food safety, these will be therefore the focus of the Project. However, other fished species which the fishermen are allowed to harvest (i.e. bait fish) will also be processed.

Q7 (a Comment): The Teaching Assistant from the Faculty of Veterinary Medicine stated that he is employed at the Department of Food Hygiene and Technology, and that in his professional opinion the Project is of great importance to the scientific community and the public sector as parasites in general are underappreciated pathogens of humans and animals alike, and that there is no systematic screening for their presence in Serbia and even in other European countries. He hopes the results of the Project will improve food safety in Serbia as modifications of existing procedures for meat inspection must be made. As an example, he mentioned the animal waste (carcasses) generated by a finding of heavy cysticercosis infestation [due to *Taenia hydatigena* (or *T. solium*)] of slaughtered animals at abattoirs, necessitating the discarding of the entire carcass. Such waste could be avoided by appropriate screening and prevention programmes.

A7: The PI agreed with the comment.

Q8: A professional risk assessment consultant asked how the Project team members will receive help if someone should sustain an injury during the capture of golden jackals.

A8: The PI explained that only trained personnel including a professional veterinarian with wildlife experience will be conducting the capture. A team member with training in providing first aid will be accompanying them.

Q9: The risk assessment consultant also asked if the team members are insured, and if the provisions regarding workers' insurance as mandated by the laws Republic of Serbia will apply during field work.

A9: TM1 confirmed that all team members are insured as employees of accredited SROs and Faculties of the University of Belgrade. Field work will be covered by travel orders and therefore all team members will be covered by workers' insurance.

The PI asked if there were any more questions and once the attendees clearly confirmed that there were none, the PI summarized the public consultations. After asking the attendees for confirmation, the PI concluded that all raised concerns were appropriately addressed and that all potential environmental and social concerns raised by the attendees were thus alleviated.

It was decided that pending the approval by the World Bank and the signing of the Grant Agreement the Project will go ahead as planned, with the schedules and deadlines and responsibilities already in place in the Project proposal as well as in the Parts I and II of the approved ESMP document.

The PI closed the meeting at 17:38.

8. List of decisions reached, and any actions agreed upon with schedules and deadlines and responsibilities

It was concluded that all raised concerns were appropriately addressed and that all potential environmental and social concerns raised by the attendees were thus alleviated.

It was decided that pending the approval by the World Bank and the signing of the Grant Agreement the Project will go ahead as planned, with the schedules and deadlines and responsibilities already in place in the Project proposal as well as in the Parts I and II of the approved ESMP document.

Public consultation report reviewed by Environmental and Social Expert

26/12/2023

Andjelka Mihajlov

A handwritten signature in blue ink, appearing to read 'Andjelka Mihajlov', written in a cursive style.