

QUESTIONNAIRE

(*) – mandatory fields

	Details about organisation
* Organisation name	Vasil Gulisashvili Forest Institute
Organisation acronym	VGFI
* Organisation Activity Type (RES - Research, HE - University, SME - Small and Medium Enterprise, IND - Industry, OTH - Other)	RES - Research
* Keywords of main research areas	Forest research and management activities
* Head of organisation (first name, family name)	Nikoloz Burduli
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* Description of organisation and its research achievements for the last five years (~ 5000 signs)
<p>vasil gulisashvili forest institute (vgfi) (Background information)</p>
<p>The Institute of Mountain Forestry was established in 1945 by the famous Georgian scientist-forester Vasil Gulisashvili whose name was given to institute after his death. The institute was a leading entity in the field of scientific research in mountain forests for whole Soviet Union. After Georgia became independent (1991) Institute was established as branch of the Academy of Sciences of Georgia. Since political changes in 2004 Institute is under the umbrella of Ministry of Education and Science of Georgia, though acts as an independent organization based on the law on “legal body of public law”. The Institute is accountable to the Ministry of Education and Science.</p> <p>The VGFI’s main purpose is fundamental theoretical and experimental research in forest sciences, and applied research and consultancy commissioned by the state or private sector. The main directions the Institute’s research programmes are:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Forests biology and ecology <input type="checkbox"/> Social and ecological functions of forests <input type="checkbox"/> Scientific background for afforestation-reforestation activities <input type="checkbox"/> Pest biology and ecology and integrated system of pest control <input type="checkbox"/> Forest inventory and management planning <input type="checkbox"/> Sustainable use of forest resources

- Community forestry development
- Agroforestry
- Strengthening of environmental awareness among schoolchildren and general society.

Since 1996 the Institute is a member of the European Forest Institute. It is also member of IPGRI, currently renamed as Bioversity International. In the field of scientific information exchange, links are established with the equivalent institutions of Russia, Ukraine, Lithuania, Finland, Sweden, Germany, Slovakia, Azerbaijan, Armenia and Switzerland.

**List of projects
prepared by VGFI during the years of 2001-2008**

- *Subject:*

Methodological recommendations for determining forest types for forest inventory and management planning

Client: Forestry Department

Beginning and end date: 2005

- *Subject:*

Biological rotation (flow, circulation) of matters and soil enhancement activities in pine tree forests of eastern Georgia

Client: Georgian Academy of Science – Grant # 18.17

Beginning and end date: 2000-2001

- *Subject:*

Biodiversity conservation measures for Eastern Georgia spruce and fir forest stands

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Biodiversity conservation measures for Eastern Georgia spruce and fir forest stands

Beginning and end date: 2000-2001

- *Subject:*

Elaboration of activities for sustainable development tourism and recreation in Georgian forests

Client: Georgian Academy of Science – Grant # 18.18

Beginning and end date: 2000-2001

- *Subject:*

Etiology of death of chestnut forests and elaboration of recommendations for their restoration

Client: Georgian Academy of Science – Grant # 18.19

Beginning and end date: 2000-2001

- *Subject:*

Eastern Georgia Beech forests stands biomasses characteristics and elaboration of activities to enhance their productivity

Client: Georgian Academy of Science – Grant # 18.16

Beginning and end date: 2000-2001

- *Subject:*

Study on existing conditions of elm trees in eastern Georgia and integrated system of their health improvement

Client: Georgian Academy of Science – Grant # 18.18

Beginning and end date: 2002-2003

- *Subject:*

Elaboration Measures to reduce land erosion in mountain forests

Client: Georgian Academy of Science – Grant # 18.15

Beginning and end date: 2002-2003

- *Subject:*

Formation of Eastern Georgia hornbeam stands, their composition and natural regeneration

Client: Georgian Academy of Science – Grant # 18.14

Beginning and end date: 2002-2003

- *Subject:*

Biological activity of East Georgia beech forest stand soils and study of their micro flora to enhance their productivity

Client: Georgian Academy of Science – Grant # 18.16

Beginning and end date: 2002-2003

- *Subject:*

<p>Elaboration of technological recommendations of establishment of plantations of endangered species (<i>Zelkova carpinifolia</i>, <i>Acer campester</i>) Client: Georgian Academy of Science – Grant # 18.16.04 Beginning and end date: 2004-2005</p> <ul style="list-style-type: none"> • <i>Subject:</i> <p>High mountainous oak's forest stands bio ecological features and activities to enhance their productivity Client: Georgian Academy of Science – Grant # 18.18.04 Beginning and end date: 2004-2005</p> <ul style="list-style-type: none"> • <i>Subject:</i> <p>Study on status of distribution of pests and deceases and elaboration of integrated management plan in the forests of Central Caucasus (Oni, Ambrolauri, Lentekhi) and Borjomi Gorge Client: World Bank – Forest Development Project, CS17-1 Beginning and end date: 2002</p> <ul style="list-style-type: none"> • <i>Subject:</i> <p>Modern pathological conditions of East Georgia walnut forests and activities for their health improving Client: Georgian Academy of Science – Grant # 18.19.04 Beginning and end date: 2004-2005</p> <ul style="list-style-type: none"> • <i>Subject:</i> <p>Forest inventory and management planning of Mtskheta forest district (13 908 ha) Client: Forestry Department Beginning and end date: 2006- up today</p> <ul style="list-style-type: none"> • <i>Subject:</i> <p>Conduct afforestation-reforestation activities and support natural regeneration in Kvareli and Telavi forest districts Client: World Bank – Forest Development Project Beginning and end date: 2006- up today</p> <ul style="list-style-type: none"> • <i>Subject:</i> <p>Forest protection from pests with safe biological measurements Client: Georgian National Scientific Fund – Grant # 353 Beginning and end date: 2006-2008</p> <ul style="list-style-type: none"> • <i>Subject:</i> <p>Study of pasture and grazing management in West Georgia Client: World Bank – Agriculture project Beginning and end date: 2007-2007</p> <ul style="list-style-type: none"> • <i>Subject:</i> <p>Surveys and status assessment of potentially threatened Pyrus spp. in the Caucasus (Azerbaijan, Armenia, Georgia) Client: Fauna&Flora International – Forest genetic resources project Beginning and end date: 2007-2007</p> <ul style="list-style-type: none"> • <i>Subject:</i> <p>Community Forests Pilot Project Kharagauli (in association with DFS GmbH and ONF International) Client: KFW– Forestry project Beginning and end date: 2007-2011</p>
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1.

	Contact Information
* Contact person (first name, family name)	Dr.Archil Supatashvili, PhD
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<p>International co-operation / Participation in EU RTD programmes or other bilateral / multilateral actions</p> <p>INTAS, TACIS, TEMPUS, COST, EUREKA, other RTD programmes (please specify programme/s, project title/s and year/s)</p>
<ol style="list-style-type: none"> 1. Study on status of distribution of pests and deceases and elaboration of integrated management plan in the forests of Central Caucasus (Oni, Ambrolauri, Lentekhi) and Borjomi Gorge Client: World Bank – Forest Development Project, CS17-1 Beginning and end date: 2002 2. Conduct afforestation-reforestation activities and support natural regeneration in Kvareli and Telavi forest districts Client: World Bank – Forest Development Project Beginning and end date: 2006- up today 3. Study of pasture and grazing management in West Georgia Client: World Bank – Agriculture project Beginning and end date: 2007-2007 4. Surveys and status assessment of potentially threatened Pyrus spp. in the Caucasus (Azerbaijan, Armenia, Georgia) Client: Fauna&Flora International – Forest genetic resources project Beginning and end date: 2007-2007 5. Community Forests Pilot Project Kharagauli (in association with DFS GmbH and ONF International) Client: KFW– Forestry project Beginning and end date: 2007-2011 6. Phoretic mites of Ips typographus in Georgia. Client: USDA Forest Service SRS 06-IC-11330129 Beginning and end date: 2006-2007

	* Please, use “X” to indicate the scientific area/s of your potential project
CHEMISTRY	
SOCIAL AND HUMAN SCIENCES	
ECONOMIC SCIENCES	
ENGINEERING SCIENCE	
ENVIRONMENT	X
AGRICULTURE AND FOOD	X
HEALTH	
MATHEMATICS	
INFORMATION SCIENCE	
PHYSICS	
NANOTECHNOLOGIES	
ENERGY	
TRANSPORT	
SPACE	

*** Summary of potential research project envisaged hosting of European researcher for the period of between 1 and 2 years**

Pathological Monitoring and Integrated Pest Management of Forests in Georgia

Forest holds a leading role among natural resources of Georgia. The country is among the richest ones with natural resources in Eurasia and is wealthy with the unique representatives of Caucasian flora. Total forest stock of Georgia consists of about 3 million hectares. Its care and protection is a national duty and represents common problem in terms of its scientific and practical wellbeing.

Among many factors, pest insects and diseases are mostly remarkable, distinguished by their ecological adaptability. Under the mass outbreak, they cause green surface reduction and/or destruction and sometimes 60-80% defoliation and dry of wood species.

In positive solution of worldwide problem of environmental recovery, main tool is protection of forests, cities, and their surroundings from pest insects. In fight against these pests, generally, human and environmental friendly biological means are used. In modern world, forests and agriculture are guarded by conducting complex protection activities, in terms of studying pests' biological, ecological and their environmental connections thoroughly. Thus, getting maximum results from minimal expenditures. Nowadays one of the most important aspects of this complex research is elaborating human and environmentally friendly, biological safe activities and perfecting the existing ones.

In 60's of the past century, Georgia intensively started to establish biological means in forest protection. From microbiological tools, bacterial insecticides are mostly remarkable, prepared based on variations of *Bacillus turingiensis* (Bt): Bitoxibacillin, Lepidocide, Dendrobacillin, Biobit, Thuricid, etc. (Imnadze, 1985, Imnadze, Supatashvili, 1983,1984, Jarkov, Tvaradze, Imnadze, Kiziria, 1985, Chkhubianishvili et al., 2000, Goginashvili,2001; Burjanadze, 2004). As well as other virus insecticides Virin-Esh used against various coniferous and foliage forest liveminer pest insects (Imnadze et al.,1986 Kiziria, 1991).

In recent years, usage of the control method, called mating disruption, for the monitoring studies and control is highly encouraged. Various countries use artificial semi chemicals – pheromones – against pests insects, pheromones traps such as *Disparlure* for the male gypsy moth, *Vertinol* – for the *Ips typographus*. Pheromone traps baited with species-specific were installed in pine forests for the mating disruption pine sawfly at different locations on Eurasian (Anderbrant, et al.,2000).

There is an increasing interest in developing the use entomopathogens as microbial control agents of invertebrate pests. Many biological control centers of different countries work on making bioformulation, bases on different biological agents (bacteria, fungi, nematodes). In these works (Begliarov,et al., 1988 Lipa,1989 Hajek, 1993; Zimmermann, 1992; Navon, 1999; Lind, et al.,2000; Nascimento,1998; Srivastava et al.,1999 Wegensteiner, 2000, Toyoshi et al., 2006; Andermat et al., 2005 Federici et al., 2005) major role plays search of endemic species and determination of their virulence level. Besides intensive works are conducted in determining entomophagous and parasitic nematodes, as well as in improving genetic method and afterwards using in biological control.

However, very important issues of forest protection, such as: specific composition of the main ecological groups of harmful entomofauna and intensity of thier distribution, accross vertical gradient, constructive model for precise prognostication of mass propagation of harmful insects, criteria of evaluation of entomoresistance of forest stands and novel, ecologically safe technologies of integrated protection of forest from harmful pests remain completely unstudied.

Numerous pest insects damage forest of Georgia. From these pests negative economic influence have live and conifer - miner pest insect: *Limantria dispar*, *Operophtera brumata*, *Neodiprion sertifer*, *Dendrolimus pini*, *Hupantria cunea* and bark beetles: *Ips typographus*, *Dendroctonus micans*, *Ips sextendantus*.

During the project realization, we plan to meet following objectives:

- pathologic monitoring studying and sanitation of diseases, principle wood species of forest in Georgia;
- diversity of forest pest species, monitoring and defining of area of their spread, their biological peculiarities and revealing-studying of entomophages, entomopathogens (virus, bacteria, fungi, protozoa) and Prognosis of their mass reproduction;

<ul style="list-style-type: none"> Biological control of pest insects – search and investigation of local bioagents (entomophages, entomopathogens, nematodes) useful for pest control as potential sources of microbial pesticides, bioassay and application and evaluation of microbial means for the control, use reorientation towards biological means for monitoring and controlling forest and IPM implementation. <p>At present scientists are actively working for the regulation of quantity, improvement of bio-method and use them in integrated managing system; for the definition of causative reasons of oak and beech drying up and the working out of practical recommendations for their sanitation; works are carried out for the improvement-renewal of entomologic collections.</p> <p>Staff of Department Forest Protection have highly experience of international collaboration, using newest methodology, with existing and acquired material technical bases, can conduct research activities.</p>
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	Please, confirm your agreement on data publication and dissemination
I agree with the publication of the data on the web-site http://www.inco-ecca.net , and dissemination among Mobility National Contact Points of the EU MS and AC (YES / NO)	YES
Date	10 December, 2008

2.

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* E-mail	enakaidze@forestinstitute.ge

International co-operation / Participation in EU RTD programmes or other bilateral / multilateral actions INTAS, TACIS, TEMPUS, COST, EUREKA, other RTD programmes (please specify programme/s, project title/s and year/s)
<p>7. Study on status of distribution of pests and diseases and elaboration of integrated management plan in the forests of Central Caucasus (Oni, Ambrolauri, Lentekhi) and Borjomi Gorge Client: World Bank – Forest Development Project, CS17-1 Beginning and end date: 2002</p> <p>8. Conduct afforestation-reforestation activities and support natural regeneration in Kvareli and Telavi forest districts Client: World Bank – Forest Development Project</p>

<p>Beginning and end date: 2006- up today</p> <p>9. Study of pasture and grazing management in West Georgia Client: World Bank – Agriculture project Beginning and end date: 2007-2007</p> <p>10. Surveys and status assessment of potentially threatened Pyrus spp. in the Caucasus (Azerbaijan, Armenia, Georgia) Client: Fauna&Flora International – Forest genetic resources project Beginning and end date: 2007-2007</p> <p>11. Community Forests Pilot Project Kharagauli (in association with DFS GmbH and ONF International) Client: KFW– Forestry project Beginning and end date: 2007-2011</p> <p>12. Phoretic mites of Ips typographus in Georgia. Client: USDA Forest Service SRS 06-IC-11330129 Beginning and end date: 2006-2007</p>
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* Summary of potential research project envisaged hosting of European researcher for the period of between 1 and 2 years
<p style="text-align: center;">Content of Deposited Carbon stock in Borjomi Region</p> <p>Background</p> <p>Increasing carbon storage in forests (i.e., forest carbon sequestration) through forestry activities is an effective way to reduce net anthropogenic emissions of greenhouse gases (GHGs), thereby mitigating the threat of adverse climate change impacts.</p> <p>United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol are considered as a first step against of prevention of climate change. Within the Kyoto Protocol developed countries, as well as countries in transition are obliged to decrease or regulate greenhouse gas emission. Decreasing of emission of greenhouse gas in 2008-2012 by 5% comparing to1990 is declared task of the Protocol.</p> <p>Attention of scientists towards of forests is increasing because of possible danger caused by global warm on forests, as one of the significant reservoir of sequestration and deposition of carbon, as well as its main role in carbon’s global cycle.</p> <p>In spite of existence of big territories covered by forests and rich biodiversity, research activities on such important problem as forest ecosystems role in carbon cycle, haven’t quite researched in Georgia, though there are several studies in Georgia, such as “Carbon sequestration through Afforestation and Reforestation in Georgia” (Forest Development Project “ICF Consulting, 2001”), also “Carbon</p>

regulation in Georgian mountain forests” (R. Chagelishvili, O. Dvalishvili, 2006), where are focused only on general questions. Thus, it’s important to carry out research measures on mentioned processes in Georgian forest ecosystems.

Total forested area of Georgia is 2 million 767.3 thousand hectares, which is approximately 40% of country’s territory (Forestry Department, 2006). Georgian forests mostly are distributed into mountain landscape and cover its 98%. Concerning of world’s forested lands it seems small amount, but playing essential role in global carbon cycle, especially for the Caucasus region, which is one of the Global 200 Eco-regions of critical importance for the conservation of the world’s biodiversity.

As was mentioned above, Georgian forest ecosystem is divers, representing with different types of landscapes and species composition. Project is focused to study of Fir (*Abies nordmanniana* (Stev) Spach) and Spruce (*Picea orientalis* (L.) Link) forest formations, as one of the dominant tree species in Georgia and mostly distributed in Borjomi region with - 268759 ha, and with wood stock of 94654.2 thousand cub.m. (Forestry Department, 2006).

Approximately 950 ha of forest were destroyed by fire after conflict in Borjomi region (Ministry of Environment Protection and Nature Resources of Georgia, 2008), most part of which is adjoining of Borjomi-Kharagauli National Park.

Project goals:

Project goal is to develop methodology for Quantitative estimation of parameter of deposited atmospheric carbon in formations of Fir and Spruce forests and undertake practical estimation in Borjomi region. Identification of regional modules of Fir and Spruce formations.

Objectives:

1. Development of methodology based on latest achievements of relevant scientifically researches in other countries;
2. Identification of fir and spruce forests biomass based on study of biomass in different components of these forests, such as main crown layer, assimilation apparatus, stem, brunches, undergrowth, regrowth, roots, grass cover, litter biomass, and soil organic substances.
3. Estimation of amount of carbon cycle (sequestration) parameters;
4. Elaboration of National criteria and modules for different fraction of biomass;
5. Identification of carbon composition of in ecosystems, according of forest types, density, and age class i.e.:
 - A) In above ground biomass – forest foliage biomass, subforest, grass cover;
 - B) In root system – different row of roots;
 - C) In organic substances of ground – humus, forest’s dead cover.
6. Increase of public awareness for local population on forests ecological importance as the main reservoir of CO² in the line of relevant international treaties to which Georgia is Party (Kioto Protocol, Climate Change Convention, Biodiversity Convention, etc.) through organizing workshops, training courses and different advertising activities (TV and Radio programmes, publishing informational leaflets and brochures, etc.);
7. Calculate of carbon loss in burned forest ecosystems in Borjomi region.

With its implementation period each phase of the project will be coordinated with the Ministry of Environment Protection and Nature Resources of Georgia as well as USAID/Georgia Mission-funded environmental program.

Expected results:

1. Methodology for Regional modules for identification deposited carbon stock in biomass of Fir and Spruce stands separate components;
2. Conversion coefficients biomass volume in damp condition in m³ recalculated in dry biomass in tones;
3. Introduction of carbon stock evaluation in forest inventory and management planning;
4. Increasing of public awareness on the forests role in carbon sequestration;

5. “Marakesh agreement (2001)” foresee difficulties of exact description of all reservoirs, thus research activities shall be cover only by definition of carbon cycle of any types of forest ecosystems, or amount of carbon sequestered by above ground biomass of forest ecosystems. The last is permitted in first phase of Kioto Protocol (2008-2011).

Staff of Department of forest biodiversity, planning and expertise have highly experience of international collaboration, using newest methodology, with existing and acquired material technical bases, can conduct research activities

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I agree with the publication of the data on the web-site http://www.inco-ecca.net , and dissemination among Mobility National Contact Points of the EU MS and AC (YES / NO)	YES
Date	10 December, 2008