



Enhancing Financial Sustainability of the Protected Areas System in Georgia

Consultancy to support elaboration of detailed development plan for establishment and operationalization of Biodiversity Monitoring Coordination Unit (BMCU)

Updated BMCU Concept and Detailed Business/Development Plan for the Institutionalized BMCU

Final Report

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Any opinions, results, conclusions or recommendations presented in the report are those of the authors and do not reflect the views of the Caucasus Nature Found, its employees or its founders.

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Abbreviations

APA – Agency of Protected Areas
BMCU – Biodiversity Monitoring Coordination Unit
BFD – Biodiversity and Forestry Department under MEPA
BNRMD- Biodiversity and Natural Resources Management Division within APA
CNF – Caucasus Nature Fund
GEF – Global Environment Facility
MEPA – Ministry of Environmental Protection and Agriculture
NACRES – Centre for Biodiversity Conservation & Research
NBMS – National Biodiversity Monitoring System
NBSAP – National Biodiversity Strategy and Action Plan of Georgia
NEAP – National Environmental Action Program of Georgia
OECD - The Organization for Economic Co-operation and Development
PA – Protected area
SPPA-Georgia Support Programme for Protected Areas in Caucasus - Georgia
TJS – Transboundary Joint Secretariat
UNDP – United Nations Development Programme
UNEP – United Nations Environment Programme
WWF – World Wide Fund for Nature

1. Introduction

The report was prepared within a Technical Assistance Agreement with the main purpose to support elaboration of detailed development plan for establishment and operationalization of Biodiversity Monitoring Coordination Unit (BMCU).

A detailed action plan for the establishment of the BMCU has been developed within the framework of the project "Enhancing Financial Sustainability of the Protected Areas System in Georgia", which is implemented with the support of the Global Environmental Fund (GEF) and the United Nations Development Program (UNDP) by the "Caucasus Nature Fund" (CNF).

The following tasks were prescribed by the assignment:

- i. Revisit the Biodiversity Monitoring Coordination Unit concept for final outlining of the details and finalize the narrative as well as graphic descriptions based on the outcomes of consultations with the stakeholders;
- ii. Development of a detailed action plan for the institutionalized BMCU.

At the first phase, based on consultations with the stakeholders, BMCU concept paper was updated including its graphical representations. And during the second phase, a detailed business /development action plan for the establishment of institutionalized BMCU was elaborated, which provides detailed recommendations on institutional structure, organizational and operational model, short-and long term development goals and associated work plan, human and technical capacities required, sustainability, partnerships/potential partners, etc.

2. Background

To date efforts to achieve the effective protection and conservation of biodiversity in Georgia remain challenging due to weak capacities in biodiversity monitoring and obtaining reliable, scientifically proven data on the state and trends of various components of biodiversity in systematic way, that is important for planning and implementing effective and adaptive conservation management.

Both at the national level and within the system of protected areas¹, the biodiversity monitoring system has been developing for almost 10 years. Despite the efforts and investments made to strengthen the monitoring system over the past years, the efficiency and effectiveness of data collection, as well as the completeness and reliability of data remain limited. This is due to the absence of agreed methods and rules for data gathering, storage, analysis and validation, as well as absence standards methods for indicators calculation², lack of human, technical and financial resources, high-turn-over of staff, improper qualification of existing personnel.

In addition to the above, an important challenge is the absence of an electronic data management system, where primary data generated as a result of field surveys (including within different protected areas) would be stored and analyzed.

The lack of coordination at the national and protected areas system level in terms of biodiversity monitoring, remains a special challenge. An important part of the biodiversity monitoring system at the national level is the indicators³ related to the development of the system of protected areas, as well as indicators about the

¹ This refers to protected areas managed by the Protected Areas Agency (strict nature reserves, national parks, natural monuments and managed reserves).

² This includes both field surveys methodologies, which result in primary data, as well as data analysis and indicator calculation methodologies

³ Such as, for example, the change in the share of the area of protected areas, including strictly protected areas, in relation to the total area of the country, the efficiency of management of protected areas, and others.

state and trends of populations and habitats of selected species, for which an important source of data is the researches and monitoring activities carried out within the protected areas. However, up to date, there is no coordination mechanism between the protected areas system and biodiversity monitoring at national level, which would ensure the collection of data within the protected areas that are important for monitoring biodiversity at the national level, as well as the collection of these data by using unified methods, that would ensure their compatibility (for subsequent consolidation and for analysis purposes) with data obtained from other sources.

Various donors, including GIZ, UNDP, UNEP, have supported the establishment of a biodiversity monitoring system at the national level. With support of the GIZ project "Sustainable Management of Biodiversity in the South Caucasus", the initial list of indicators of the National Biodiversity Monitoring System (NBMS) was defined and basic and repeated studies were conducted to elaborate some indicators. Within the framework of the UNDP project "Harmonization of information management for improved knowledge and monitoring of the global environment in Georgia", an environmental knowledge and information management system (eims.mepa.gov.ge) was developed, including a biodiversity modules (with 6 sub-modules, including species and habitats, protected areas, forest ecosystems, hunting and fishing, biosafety, financial resources for biodiversity conservation). However, the mentioned electronic data management system is not functioning at present. Consequently, there is no unified electronic data base at the national level, where information and data obtained from various sources would be collected and stored. Currently, in terms of species monitoring, several processes are underway with support of donor organizations, however, due to the lack of coordination and a unified system, it is not possible to collect and analyze the data in systematic way⁴.

Within the Ministry of Environmental Protection and Agriculture, the capacities of the structural unit responsible for the development of the national biodiversity monitoring system are extremely limited in terms of human, technical and financial resources. Only basic research some species populations and habitats has been carried out. Further monitoring activities are irregular. Monitoring of threatened species is mainly carried out within protected areas and does not provide a complete picture of their population status and trends across the country.

Stakeholders consider the institutionalization of the system as one of the ways to overcome the existing challenges for biodiversity monitoring.

UNDP/GEF project CNF commissioned Biodiversity Conservation and Research Center NACRES to coordinate the identification of options/models for the institutionalization of biodiversity monitoring within the protected areas system⁵. The mentioned study includes a detailed analysis of the challenges and their causes related to the monitoring of biodiversity within the protected areas system, as well as recommendations, which are reflected in the present report.

As a result of the technical assistance provided by NACRES, three different models of institutional arrangement of biodiversity monitoring were developed. After consultations with stakeholders, it was agreed that it is particularly important to institutionalize the coordination of biodiversity monitoring at different levels and, in this context, to strengthen the capacities of the Ministry of Environmental Protection and Agriculture (national level) and the Agency of Protected Areas (level of protected areas system). The selected model of the institutional arrangement of biodiversity monitoring is presented in Annex 2.

Based on consultations with stakeholders, the recommended model of the institutional arrangement of biodiversity monitoring was revisited and updated within the this assignment. Results are presented on the figure 2. the action plan for the institutional development of the coordinated system of biodiversity monitoring was prepared according to this updated model.

⁴ Fourth National Environmental Action Plan (NEAP) 2022-2026.

⁵ Biodiversity monitoring in the protected areas system of Georgia: practice, challenges, opportunities, NACRES, Ekaterine Kakabadze, Irakli Shavgulidze, 2021

With the support of CNF, a study of approaches and experiences of European countries in terms of species and habitats monitoring was also conducted. Biodiversity monitoring schemes in several European countries (Norway, Sweden, Czech Republic, Hungary and Slovakia) are reviewed and recommendations for Georgia are provided in abovementioned report, which are also reflected in this report.

This report is also envisages assessments related to the development of a biodiversity monitoring system conducted within the framework of the GIZ project "Sustainable Management of Biodiversity in the South Caucasus" (IBiS).

3. Concept of institutional arrangements for biodiversity monitoring

3.1 Basic assumptions

What does a biodiversity monitoring system include?

All stakeholders must have a common understanding of the objectives and purpose of the biodiversity monitoring system at different levels.

The goals of the **biodiversity monitoring system at the national level** are to assess the state of various components of biodiversity, identify changes and trends, their causes, and determine the expected results, for the development of result-oriented conservation policy and response measures.

Based on the results of biodiversity monitoring, a targeted policy and priorities for biodiversity conservation should be defined, planning should be improved and appropriate legislative changes should be made as necessary.

While planning the biodiversity monitoring at the national level, reporting obligations at the national and international levels should be taken into account, in particular what data and information should be collected and analyzed in order to ensure submission of complete and comprehensive reports within the framework of international treaties to which Georgia is a party, as well as at the for national level reporting purposes (for example, for development national report on the State of the Environment⁶).

Considering the above mentioned, the concept of the national biodiversity monitoring system was developed in previous years⁷ and 25 indicators were defined according to the internationally recognized and widely used OECD model (state-pressure-response indicators). The mentioned indicators were approved by the order of the Minister of Environmental Protection #262 of December 18, 2012 on the "Rules and Procedures for the Unified Biodiversity Monitoring System"⁸.

Biodiversity monitoring indicators at the national level cover various areas, including indicators that describe the state and trends of individual species populations and habitats at the national level, changes in the conservation status of species, changes in the intensity of threats affecting biodiversity (intensity of Agriculture, Forestry, Fishery), the tendency of protected areas system development, the state and trends of forest ecosystems, public awareness and attitude towards the biodiversity conservation, the tendency to mobilize financial resources for biodiversity conservation, etc.

The updated (current) version of the biodiversity system indicators at the national level is presented in Fig.1.

⁶ The National Report is a summary of the information available on the state of Georgia's environment, which is produced every 4 years in accordance with the Law of Georgia "On Environmental Protection".

⁷ It refers to the concept and indicators developed within the framework of the project "Sustainable Management of Biodiversity in the South Caucasus" (GIZ).

⁸ After the approval of the mentioned rules, the list of indicators was updated several times, however, no relevant amendment were made to the Minister's order.

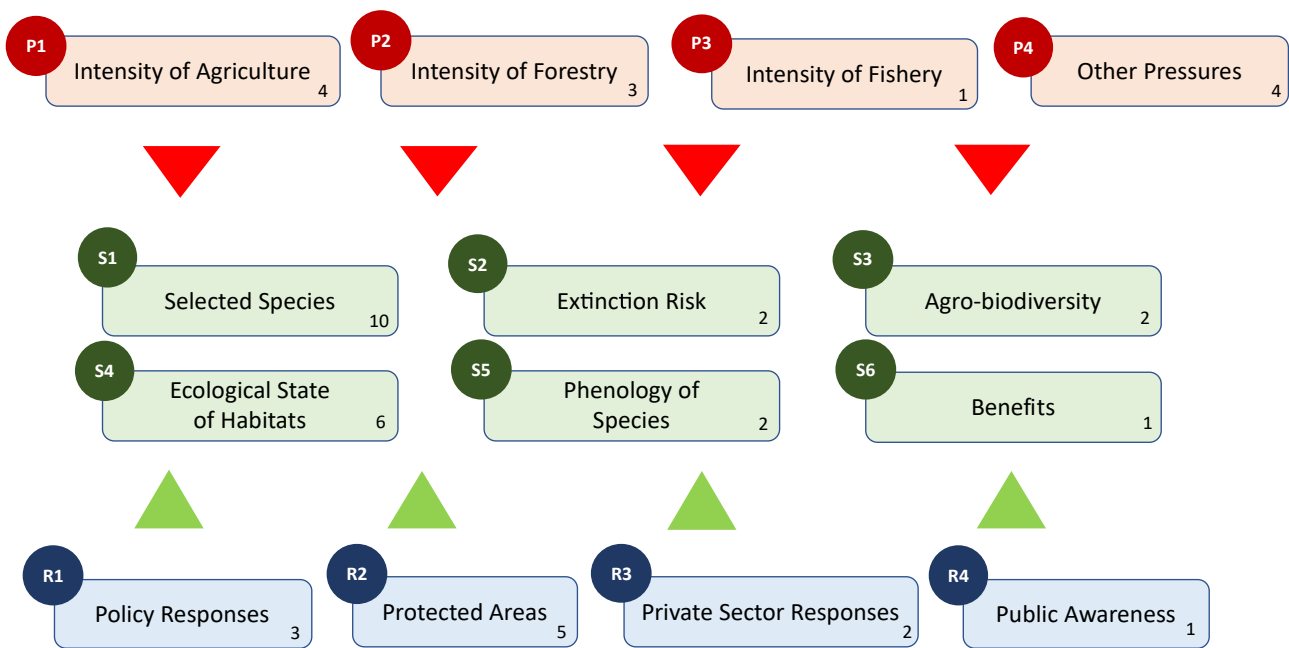


Figure 1. National System of Biodiversity Monitoring (Source: Georgia’s New NBMS, An Introduction, Salome Nozadze & Christian Gonner November, 2020).

As mentioned above, the national biodiversity monitoring system includes pressure, state and response indicators, among which one of the indicators is the state of the selected species (see Chapter 7 for more details on the selection of species at the national and protected areas system level).

As a result of consultations with stakeholders, it was revealed that based on the goals of the project "Enhancing financial sustainability of the protected areas system in Georgia" (within the framework of which the present BMCU concept and action plan was developed), it is appropriate to focus on strengthening the coordination of species and habitat monitoring, both at the national level and within the system of protected areas. Accordingly, the BMCU concept and action plan presented in this study are focused on only one direction of the national biodiversity monitoring system - the establishment of a coordinated system for species and habitats monitoring.

*Based on the above, **biodiversity monitoring** below means only monitoring of species and habitats, i.e. systematic collection, analysis and interpretation of data on species (wild animals, wild plants and fungi) and habitats (according to the EUNIS habitat classification) across the country, according to unified (standard) methodologies⁹. The monitoring of trends in ecosystem services, different ecosystems (forests, grasslands, water ecosystems) is carried out through separate studies that require a significant budget. However, the data obtained as a result of such studies should also be accumulated in an electronic data management system and used in policy-making and reporting processes.*

Biodiversity Monitoring Coordinating Unit (BMCU)

Currently, biodiversity monitoring is within the responsibility of the Ministry of Environmental Protection and Agriculture and several agencies. In particular, in the Ministry of Environmental Protection and Agriculture, the organization and coordination of the national biodiversity monitoring system is under the competence of the **Biodiversity and Forestry Department**. One of the tasks of the **Agency of Protected Areas** is to

⁹ A similar framework for biodiversity monitoring is recommended by the Technical Background Paper, Experience and Recommendations Based on European Countries Approaches, DH&P, Michael Hosek, CNF, 2021

organise monitoring and scientific research within protected areas, and process, store and disseminate observation data¹⁰. This task is entrusted to the Biodiversity and Natural Resources Management Division, which was recently established within the Planning and Development Service¹¹. (The tasks of the mentioned structural units and agencies in this regard are discussed in more detail below).

Based on the above, interviews with key stakeholders revealed that they do not see the need to create a biodiversity monitoring coordination unit as a new separate structural unit, neither in the Ministry of Environmental Protection and Agriculture nor in the Protected Areas Agency.

Accordingly, the action plan for the establishment of the Biodiversity Monitoring Coordination Unit is aimed at strengthening the capacities of the existing structural units for coordinated planning and implementation of comprehensive and effective monitoring of biodiversity.

3.2. Objectives of the Biodiversity Monitoring Coordination Unit

Existing Policy and Standards

The importance of an effective biodiversity monitoring system development is highlighted in different strategic documents.

One of the national targets of the **Biodiversity Strategy and Action Plan (NBSAP) of Georgia** is to assess the status of biodiversity (state of species and habitats) through the improvement of scientific and baseline knowledge and the establishment of an effective monitoring system¹².

In order to achieve the mentioned target, the NBSAP defines the following two objectives:

- C.1- o1. Establish the status of Georgia's biodiversity through species inventories and relevant assessments
- C.1- o2. Set up an effective and comprehensive biodiversity monitoring system

The Fourth National Environmental Action Program of Georgia for 2022-2026¹³ emphasizes that "for sustainable management and conservation of biodiversity, it is necessary to have comprehensive information and data on the components of biodiversity". Accordingly, it is planned to improve the biodiversity monitoring system, which means elaboration of monitoring methods, establishing an electronic data processing and storage system, and providing human resources with appropriate qualifications, as well as providing the studies of selected animal species and economically significant plants.

Accordingly, the number of species for which monitoring/resource assessment methodologies have been developed and systematic studies are carried out both within protected areas and outside them is defined as an indicator of achievement of the NEAP target on protection of biodiversity, maintenance of ecosystem services and sustainable use of biological resources. According to the NEAP 4, by 2026, monitoring methodologies should be developed for at least 23 species.

Among the tasks defined by NEAP 4 in the Black Sea environmental protection section is the promotion of the conservation of sturgeon species under threat of extinction. For this purpose it is planned to develop a monitoring program of sturgeon species and obtain comprehensive data at least for 3 species by 2026.

¹⁰ Law on the System of Protected Areas.

¹¹ The Biodiversity and Natural Resources Management division was established in March 2022.

¹² National Biodiversity Strategy and Action Plan of Georgia 2014-2020, approved by the N343 (dated May 8, 2014) Decree of Georgian Government, National Target C.1.

¹³ The Fourth National Environmental Action Program of Georgia for the years 2022-2026 was approved by the Decree #1629 of the Government of Georgia dated September 7, 2022.

The actions defined by NEAP 4 for the monitoring of species and habitats are accordingly reflected in the present action plan for the development of BMCU.

Purpose of Biodiversity Monitoring Coordinating Unit

Taking into account the targets set by the strategic documents mentioned above, the purpose of establishing a biodiversity monitoring coordination unit is to create an appropriate institutional base for the coordinated planning and implementation of a full-fledged monitoring of biodiversity in order to ensure: (i) the development of appropriate conservation policies and strategies based on the latest and reliable data on status and trends of species and habitats and (ii) high quality reporting on national and international levels on state and trends of biodiversity.

3.3 Biodiversity monitoring coordination tasks at different levels

Coordination of biodiversity monitoring at the national level

Species and habitats monitoring at the national level should cover whole country territory not only protected areas under the management of APA. The distribution of populations and habitats of species is not limited by the protected areas boundaries with some exceptions. In order to define appropriate conservation strategies and develop species conservation management plans, it is important to identify the population status or trends of a particular species at the country level (or more broadly at the regional level). Therefore, it is recommended to develop a species and habitat monitoring system at the national level, which necessarily covers protected areas as well, and which collects, compares and analyzes information on species and habitats from different sources at the country level.

It should be mentioned, that no one European state has developed a protected areas monitoring system only. PAs are only legal tool, while biodiversity has been changing its quality and quantity regardless legal borders¹⁴. Consequently, from the beginning, it is important to develop nation-wide basic scheme for biodiversity monitoring, which integrates data from different sources (PAs under APA management, other protected areas (protected landscapes, multi-purpose use areas, transition zones of biosphere reserves, Emerald Sites), as well as other data obtained as a result of monitoring carried out in the other territories (forest areas).

Based on the above, the coordination of the biodiversity monitoring system at the national level includes (but is not limited to) the following tasks:

- Determination of biodiversity monitoring indicators at the national level;
- Development of unified, standard methodologies¹⁵ for monitoring (primary data collection, storage, processing, reporting) according to indicators (which also includes standard methodologies for different species and habitats monitoring);
- Providing supervision to ensure data quality;
- Collecting information and data from various sources and archiving in a unified electronic database;
- Consolidation, analysis and interpretation of information received from different sources;
- Reporting on the national and international levels based on obtained data analyses and interpretation;
- Development of result-oriented biodiversity conservation policy and recommendations for legal amendments based on monitoring results.

Information for the national species and habitat monitoring system will be provided from various sources, including:

¹⁴ Technical Background Paper, Experience and Recommendations Based on European Countries Approaches, DH&P, Michael Hosek, CNF, 2021

¹⁵ This refers to both field research and indicator calculation methodologies

- Structural units and agencies in the system of the Ministry of Environmental Protection and Agriculture, including monitoring programs and researches carried out by non-governmental organizations and scientific institutions within protected areas under the management of APA;
- From monitoring programs implemented in protected landscapes, multi-purpose use areas, biosphere reserves, Emerald Network, important biodiversity areas outside protected areas;
- From the studies carried out within the framework of consulting services purchased by the Ministry;
- From the researches carried out with support of donor organizations;
- From the researches carried out by non-governmental organizations, scientific institutes/universities.

Coordination of biodiversity monitoring at the level of the system of protected areas

Important data and information on species and habitats trends at the national level are obtained as a result of the monitoring carried out within the system of protected areas. Accordingly, the objectives of biodiversity monitoring in protected areas system should be reconciled with the objectives of the national biodiversity monitoring system. The monitoring of different species and habitats should be carried out with standard methodologies agreed at the national level, so that the obtained information and data are compatible with the data obtained from other sources (outside the protected areas) about the same species and habitats. In turn, the performance of this function requires the strengthening of capacities for biodiversity monitoring at the level of the protected areas system (both the protected areas agency and individual protected areas administrations).

Based on the above, the coordination of biodiversity monitoring at the protected areas system level (which should be the function of the Biodiversity and Natural Resources Management Division) includes the following issues:

- Development of biodiversity monitoring programs for individual PAs in coordination with the national biodiversity monitoring system and supervision of their implementation;
- Participation in the development of specific guidelines, standard methodologies and rules for monitoring individual components of biodiversity (species populations, habitats, ecosystems within protected areas, threats, etc.);
- Providing trainings on standard field research methodologies (manuals, rules) to specialists responsible for biodiversity monitoring in PAs administrations;
- Determining the resources needed for the effective implementation of the monitoring program in each PA (human resources (qualification requirements, trainings), financial resources, technical equipment);
- Coordination of research carried out by invited specialists;
- Development and administration of electronic data management system, input, processing, analysis, interpretation of data obtained from individual PAs, including with the involvement of external experts, as necessary;
- Planning of adaptive management of protected areas based on data obtained as a result of monitoring.

In order to carry out the aforementioned multifaceted functions, it is necessary to staff the Biodiversity and Natural Resources Management Unit within APA, with specialists with appropriate qualifications, development of software for the biodiversity monitoring system at the level of the protected areas system, close coordination with the national biodiversity monitoring system, as well as with non-governmental organizations and scientific institutions involved in biodiversity monitoring and research, provision of easy access to obtained information and data.

The implementation of adaptive management based on biodiversity monitoring results and, therefore, on the latest, scientific and reliable information and data, within the PAs is crucial for system effectiveness.

Monitoring programs and data systematization are important for adaptive management planning, which involves continuous adjustments of management approaches and strategies based on the results achieved.

Accordingly, the monitoring program at the level of individual protected areas should be specific and tailored to specific management objectives in order to be able to assess the progress of achieving the management objectives. At the same time, priority species and habitats for monitoring should be determined in coordination with the interests of biodiversity monitoring at the national level. It should be taken into account that most of primary data for biodiversity indicators calculation at national level, are generated through the monitoring programs implemented in individual PAs.

Therefore, it is important to reconcile the monitoring programs of individual PAs with the requirements and indicators of the national biodiversity monitoring system.

Biodiversity monitoring in individual PAs should not only focus on monitoring populations of selected species, but should also include monitoring of specific habitats and ecosystems for conservation of which the protected area was established (for example, monitoring of forest, peatlands, surface water bodies, ecosystem services).

3.4 Institutional arrangement of biodiversity monitoring

3.4.1 Biodiversity monitoring at the national level

The organization and coordination of the national biodiversity monitoring system in the Ministry of Environmental Protection and Agriculture is the task of the Biodiversity and Forestry Department¹⁶. All three divisions within the BFD (Biodiversity Division, Forest Policy Division and Protected Areas Policy Division) within the scope of their competences participate in performing of this task.

According to the Department's statute, the organization and coordination of the national biodiversity monitoring system is primarily the function of the Biodiversity Division. However, as mentioned above, a national biodiversity monitoring system covers many different areas and may significantly exceed the competence of a this division. *For example, the competence of the Forest Policy Division includes the provision of the National Forest Inventory and the Forest Information and Monitoring System (FIMS), as well as the development of appropriate recommendations based on the results of forest monitoring, and therefore calculation forest ecosystems related indicators.*

Consequently, specific tasks for biodiversity monitoring should be defined for each division under the BFD. Depending on the functions, the Protected Areas Policy Division¹⁷ should be responsible for Protected Areas System related indicators. And calculation of indicators related to individual species populations and habitat trends, changes in species conservation status, spread of invasive species and other similar indicators should be the competence of the Biodiversity Division.

Due to the complexity of the national biodiversity monitoring system, the production of some indicators (public awareness and attitude, mobilization of financial resources, environmental pollution) may be beyond the competence of the BFD and require the involvement of other structural units within the Ministry's system, as well as other agencies.

¹⁶ Statute of the Biodiversity and Forestry Department, approved by the Order of the Minister of Environment and Agriculture #2-1385, September 27, 2021

¹⁷ It should be noted that according to the Law "On the System of Protected Areas", the Ministry of Environment Protection and Agriculture is authorized to coordinate environmental monitoring and scientific research in protected areas within its competence.

3.4.2. Biodiversity monitoring at the protected areas system level

One of the tasks of the APA is to organize monitoring and scientific research within protected areas, to process, store and disseminate observation data¹⁸. This task is entrusted to the Biodiversity and Natural Resources Management Division¹⁹, which was recently established within the Planning and Development Service. The functions of the BNRMD include the supervision and monitoring of nature resources use within the protected areas in coordination with the relevant services of the Ministry, as well as the supervision of scientific research and biodiversity monitoring activities in the protected areas. The functions of the BNRMD include the targeted processing of data obtained as a result of scientific research on protected areas, based on which, the division should develop strategies for the restoration, maintenance and conservation of ecosystems and individual species populations within protected areas.

Organization of scientific research within the individual PAs, recording and monitoring of natural processes and genetic resources, existing natural ecosystems and species of wild animals and wild plants is the function of the administrations of the individual PAs, namely the function of the protection divisions under administrations.

3.4.3 Other agencies of the MEPA²⁰

The competence of the National Forest Agency (NFA) is to monitor the forest under the management of the agency and to create a database obtained as a result of the monitoring²¹. The organization of forest monitoring in the NFA belongs to the duties of the Forest Monitoring Department. According to the "Georgian Forest Registration System, Categorization and Monitoring Rules"²², the forest registration system of Georgia should be an important source of information about the plant species, including protected species, as well as wildlife. As for today, the forest accounting system is mainly aimed at assessing the ecological state of the forest at the ecosystem level and planning forestry management, rather to the collection data of flora and faunas species populations within the forests.

Research and monitoring of fish, marine mammals, associated hydrofauna, planktonic and benthic invertebrates, planktonic and benthic algae, microbiota, accompanying water quality parameters in the Black Sea and inland waters is the function of the Department of Fisheries, Aquaculture and Aquatic Biodiversity of the National Environment Agency, under the Ministry of Environmental Protection and Agriculture²³.

In the system of the MEPA, monitoring of wildlife populations and their habitats (organization of research, data processing, storage and distribution) is within the competence of the National Wildlife Agency.

Accordingly, in the process of institutionalization of biodiversity monitoring, the potential functions and capabilities of the above-mentioned agencies should be assessed in detail and their specific role in biodiversity (species and habitats) monitoring should be reviewed/defined.

¹⁸ Law "On the System of Protected Areas".

¹⁹ The division was established in the Agency of Protected Areas in March 2022.

²⁰ Within the framework of the present study, all those agencies that may contribute to the formation and operation of the species and habitat system at the national level were identified, although their capacities in this regard were not assessed, except APA.

²¹ Statute of NFA, approved by the order #28 of the Minister of Environmental Protection and Natural Resources of Georgia dated July 30, 2010

²² "Regulation of the Georgian Forest Registration System, Categorization and Monitoring", approved by the Resolution #427 of the Government of Georgia on August 25, 2021

²³ Statute of the National Environment Agency, approved by the order #2-255 of the Minister of Environmental Protection and Agriculture of Georgia dated April 19, 2018.

3.4.4. Other authorities involved in biodiversity monitoring

As for today, 4 protected landscapes have been created in Georgia (Aragvi, Truso, Machakhela and Tusheti) and it is planned to establish another protected landscape (Tana-Tedzami). The process of establishment of Samukhi multi-purpose use area is underway. Nomination of two Biosphere Reserve (Three Alazani and Dedoplistskaro biosphere reserves) has been adopted recently by the UNESCO's "Man and Biosphere" program.

Protected landscapes are managed by the non-governmental (non-commercial) legal entities established by the respective municipality. It is assumed that biosphere reserves also will be managed by non-governmental (non-commercial) legal entities.

Biodiversity research and monitoring is one of the important management tasks of protected landscapes, multi-purpose use areas and biosphere reserves, which requires personnel with appropriate qualifications, technical equipment and access to an electronic data management system.

3.4.5 Cooperation and potential partners

Biodiversity monitoring at all levels requires collaboration with partners and donors. Some biodiversity components may be monitored by PAs administrations. However, field studies carried out by scientific institutes/non-governmental organizations and specialists of individual species/groups will always be of great importance.

The involvement of the scientific sector will be necessary for the consolidation of data from different sources, for in-depth analysis and, especially, for interpretation, for analyses of different factors in order to identify the causes of the trend.

External technical assistance is essential for the development of standard methodologies for biodiversity monitoring.

The following organizations have been actively involved in biodiversity monitoring system development in recent years: WWF Caucasus Program Office, Biodiversity Conservation and Research Center Nacres, Union of Field Scientists Campester, Society for Nature Conservation SABUKO, Ilia State University, Tbilisi Zoo, Batumi State University, Institute of Phytopathology and Biodiversity. Close cooperation with the mentioned organizations is especially important for the development of standardized monitoring methodologies for specific species, field studies, quality control of data received within field studies, and data interpretation.

Funding allocated from the state budget for monitoring individual species and habitats is very scarce. Therefore, in the development of the monitoring system at all levels, the main source of funding will donor organizations, including, CNF, SIDA, KfW. It is important to coordinate donor support in developing a biodiversity monitoring system.

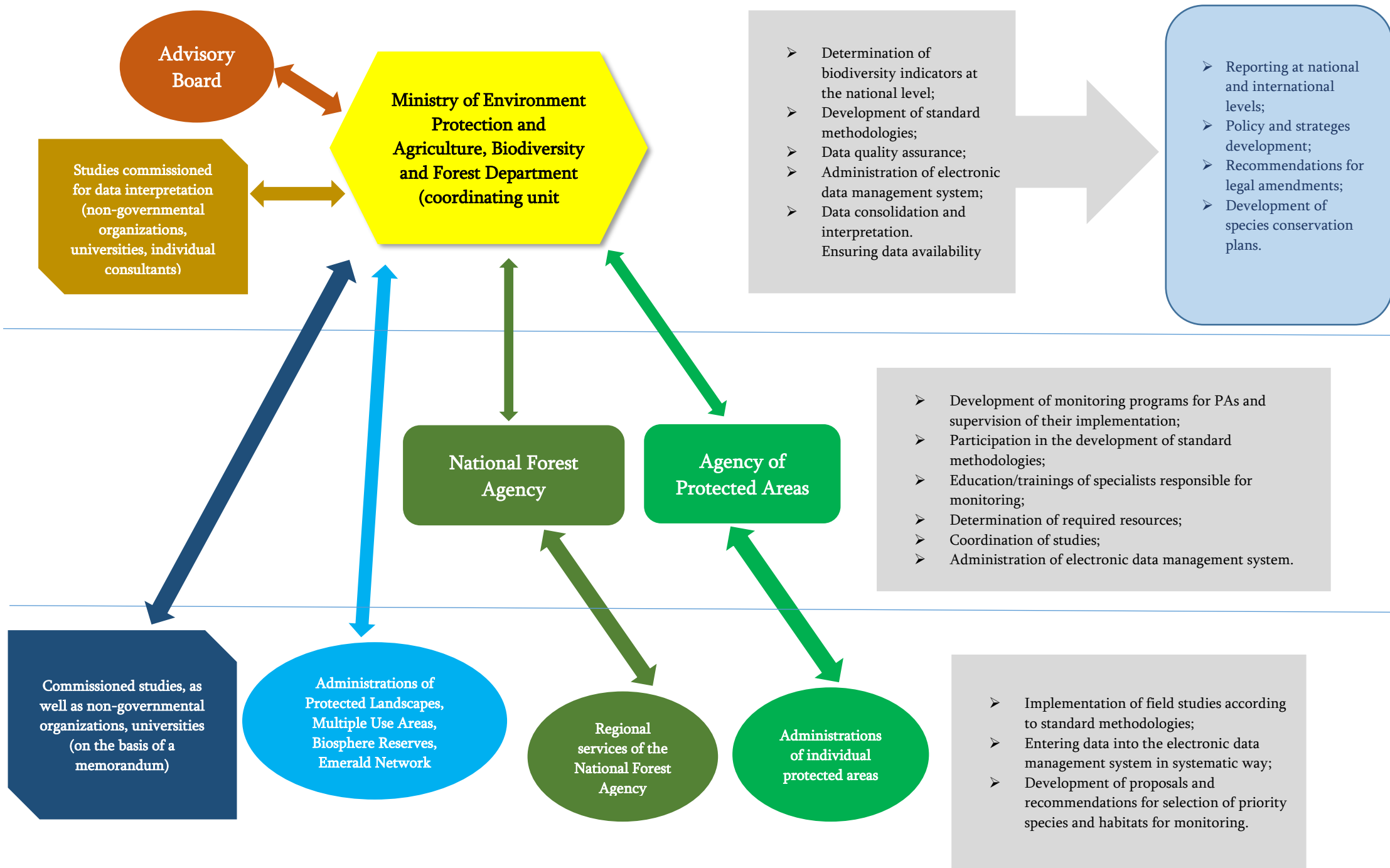
Based on the above, it is important to create an advisory board that will assist BFD in coordinating biodiversity monitoring at the national level, as well as ensuring transparency and coordination with donors. Accordingly, national NGOs, as well as international organizations (CNF, WWF CPO, KfW, UNDP, GIZ) should be represented in the advisory board. However, as mentioned above, the involvement of non-governmental organizations and donors will be necessary at all stages of the development and operation of biodiversity monitoring, including the development and selection of methodologies, identification of priorities, data analysis and interpretation²⁴.

²⁴ Biodiversity Monitoring in the Protected Areas System of Georgia: Practices, Challenges, Opportunities, NACRES, 2021

3.4.6 Institutional arrangement scheme for biodiversity monitoring

In the figure below, a scheme of institutional arrangement of biodiversity monitoring is visualized. The gray background shows the biodiversity monitoring tasks at each level.

Figure 2. Organizational chart of institutional arrangements for biodiversity monitoring



4. Human Resources

4.1 Personnel

Biodiversity and Forest Department

Coordinating the monitoring of species and habitats at the national level is the function of the Biodiversity Division of the BFD. As of today, there are ?? specialists in the division. Employee job descriptions are developed but not approved. The distribution of functions among employees is done in accordance with the instructions of the heads of department and divisions. Coordination of biodiversity monitoring system development is responsibility only one specialist who also has a number of other tasks. The work load of other specialists in the division does not allow them to take on additional tasks for the development of the biodiversity monitoring system. In addition, they do not have the appropriate competencies to perform the tasks defined at the national level for the coordination of species and habitat monitoring.

In order to establish a continuous and reliable monitoring system of species and habitats at the national level, it is necessary to staff the Biodiversity Division with personnel with relevant qualifications, whose minimal competencies and main directions of the job description are given below:

Position	Minimal Competence	Description of functions
Biodiversity monitoring specialist - group leader	<p>Field of education: Bachelor's/Master's degree in natural sciences; At least 5 years of work experience in the field of biodiversity conservation</p>	<ul style="list-style-type: none"> - selection and determination of indicators of the national biodiversity monitoring system; - approval of the methodologies for data gathering and processing according to the selected indicators; - preparation of appropriate information for international and national reporting and strategic planning; - coordination of the development of the electronic data management system of the National Biodiversity Monitoring System, including the species and habitats module; - Determining the content of the electronic data management system; - Control of the work performed by the members of the monitoring group.
Flora and habitat monitoring specialist	<p>Field of education: Bachelor's/Master's degree in natural sciences; Specialization: Botany At least 3 years of work experience in field research and monitoring of flora species</p>	<ul style="list-style-type: none"> - preparation of ToRs for the development/updating of monitoring methodologies for selected flora species; accepting draft methodologies and submitting them for approval; - planning and conducting trainings together with external specialists; - coordination of monitoring of selected species of flora; - collection of data from various sources into a unified electronic

		system, quality control, if necessary, preparation of ToRs for external assistance for data interpretation and analysis and acceptance of draft reports produced.
Mammals Monitoring Specialist	<p>Field of education: Bachelor's/Master's degree in natural sciences; Specialization: Zoology At least 3 years of work experience in monitoring field studies of mammal species.</p>	<ul style="list-style-type: none"> - preparation of technical tasks for development/update of monitoring methodologies for selected mammal species; accepting draft methodologies and submitting them for approval; - planning and conducting trainings together with external specialists; - coordination of monitoring of selected species; - Collection of data from various sources into a unified electronic system, quality control, if necessary, preparation of ToRs for external expert assistance for data interpretation and analysis and draft reports produced.
Birds Monitoring Specialist	<p>Field of education: Bachelor's/Master's degree in natural sciences; Specialization: Zoology At least 3 years of work experience in monitoring field studies of Bird species.</p>	<ul style="list-style-type: none"> - preparation of technical tasks for development/update of monitoring methodologies for selected birds species; accepting draft methodologies and submitting them for approval; - planning and conducting trainings together with external specialists; - coordination of monitoring of selected species; - Collection of data from various sources into a unified electronic system, quality control, if necessary, preparation of ToRs for external expert assistance for data interpretation and analysis and draft reports produced.
Fish species Monitoring Specialist	<p>Field of education: Bachelor's/Master's degree in natural sciences; Specialization: Zoology At least 3 years of work experience in monitoring field studies of fish species.</p>	<ul style="list-style-type: none"> - preparation of technical tasks for development/update of monitoring methodologies for selected fish species; accepting draft methodologies and submitting them for approval; - planning and conducting trainings together with external specialists; - coordination of monitoring of selected species; - Collection of data from various sources into a unified electronic system, quality control, if necessary, preparation of ToRs for external

		expert assistance for data interpretation and analysis and draft reports produced.
Data management specialist	Field of education: Bachelor's/Master's degree in natural sciences; Specialization: GIS-analysis. At least 3 years of work experience in the development and operation of electronic data management systems in the field of environmental protection	<ul style="list-style-type: none"> - Development of a metadata file for the creation of species and habitats database, which defines the minimum information that should be included in relation to each data in the database. - Planning and coordination of the gradual development of the electronic data management system

Agency of Protected Areas

The coordination of species and habitat monitoring at the level of protected areas is the responsibility of the Biodiversity and Natural Resources Management Division of the APA.

As of today, there are three vacant positions (the head of the division, the main specialist and the senior specialist) in the division. Employee job descriptions are developed but not approved.

In order to establish a continuous and reliable monitoring system of species and habitats in the system of protected areas (in protected areas under the APA management), BNRMD should be staffed with personnel with relevant qualifications, whose minimum competencies and main directions of the job description are given below:

Position	Minimal Competence	Description of functions
Head of the division	Field of education: Bachelor's/Master's degree in natural sciences; At least 5 years of work experience in the field of biodiversity conservation	<ul style="list-style-type: none"> - selection of priority species and habitats for monitoring in individual PAs under the APA management in cooperation with the Biodiversity Monitoring Specialist of the BFD. - Participation in the development of standard methodologies for monitoring of the selected species and habitats; - Supervision and quality assurance of biodiversity monitoring program implementation within individual PAs; - planning and organizing trainings for specialists responsible for monitoring; - assessment of optimal human and technical resources needed for biodiversity monitoring for protected areas administrations;
Flora and habitat monitoring specialist	Field of education: Bachelor's/Master's degree in natural sciences; Specialization: Botany	<ul style="list-style-type: none"> - Organize and provide trainings for individual PAs administrations specialists on the monitoring methodologies of the selected

	At least 3 years of work experience in field research and monitoring of flora species	<p>species of flora, with the participation of external experts;</p> <ul style="list-style-type: none"> - coordination of monitoring of selected flora species within PAs; - Quality control of field studies, collection of data from different PAs in a unified system of electronic data management, quality control, analysis. - cooperation with flora monitoring specialist of the BFD.
Mammals Monitoring Specialist	<p>Field of education: Bachelor's/Master's degree in natural sciences; Specialization: Zoology</p> <p>At least 3 years of work experience in monitoring and field studies of mammal species.</p>	<ul style="list-style-type: none"> - Organize and provide trainings for individual PAs administrations specialists on the monitoring methodologies of the selected species of mammals, with the participation of external experts; - coordination of monitoring of selected mammal species within PAs; - Quality control of field studies, collection of data from different PAs in a unified system of electronic data management, quality control, analysis. - cooperation with the mammal monitoring specialist of the BFD.
Birds Monitoring Specialist	<p>Field of education: Bachelor's/Master's degree in natural sciences; Specialization: Zoology</p> <p>At least 3 years of work experience in monitoring and field studies of Bird species.</p>	<ul style="list-style-type: none"> - Organize and provide trainings for individual PAs administrations specialists on the monitoring methodologies of the selected species of birds, with the participation of external experts; - coordination of monitoring of selected bird species within PAs; - Quality control of field studies, collection of data from different PAs in a unified system of electronic data management, quality control, analysis. - cooperation with the bird monitoring specialist of the BFD.
Fish species Monitoring Specialist	<p>Field of education: Bachelor's/Master's degree in natural sciences; Specialization: Zoology</p> <p>At least 3 years of work experience in monitoring and field studies of fish species.</p>	<ul style="list-style-type: none"> - Organize and provide trainings for individual PAs administrations specialists on the monitoring methodologies of the selected fish species, with the participation of external experts; - coordination of monitoring of selected fish species within PAs; - Quality control of field studies, collection of data from different PAs in a unified system of electronic

		<p>data management, quality control, analysis.</p> <ul style="list-style-type: none"> - cooperation with the fish species monitoring specialist of the BFD.
Data management specialist	<p>Field of education: Bachelor's/Master's degree in natural sciences; Specialization: GIS-analysis. At least 3 years of work experience in the development and operation of electronic data management systems in the field of environmental protection</p>	<p>planning and coordination of the gradual development of the electronic data management system;</p> <p>Administration of electronic data management system.</p>

As of today, the monitoring of biodiversity in the administrations of individual PAs is coordinated by a natural resources specialist who gives appropriate instructions to the rangers of the protection department. Data collection in the field is carried out by rangers. According to various assessments, the general qualification of personnel for conducting biodiversity monitoring is low and further strengthening of capacities in this regard is necessary²⁵.

Currently, there is only one natural resource management specialist in the majority of PAs administrations (in some places this position is vacant), while in Borjom-Kharagauli and Kolkheti national parks there are two natural resource management specialists. In addition to biodiversity monitoring the duties of a natural resource management specialist, as well as rangers, include many other tasks. In addition to the coordination of biodiversity monitoring, the duties of a natural resources specialist include determination of conservation measures, assessment of threats, planning of resource use, educational activities and others. One specialist is obviously not enough to perform these duties.

The duties of rangers include prevention, detection and suppression of law violations, participation in rescue operations and fire prevention, accounting of natural resources, participation in the regulation of resource use (for example, issuing documents on logging, control of logging), support and control of visitors, communication with local community and many other duties, the perfect performance of which is certainly impossible. Biodiversity monitoring activities remain among the lowest priority duties.

Based on the above, it is recommended to add a biodiversity monitoring specialist position to all administrations of PAs, whose direct duty will be the coordination of biodiversity monitoring within the protected area.

Depending on the specifics of individual PAs, it may be appropriate for some protected areas to hire several biodiversity monitoring specialists. For example, it is recommended to have a separate staff of ornithologists on Kolkheti and Javakheti PAs, who will provide continuous and qualified monitoring of bird species.

Conducting field surveys and field observations can be carried out by rangers who will be trained appropriately. For this purpose, the rangers' workload and specific technical tasks should be diversified. In each protected area, a group of rangers with minimum competence (education/experience) may be selected for further training to carry out biodiversity monitoring activities, and if necessary, new staff with appropriate qualifications should be hired. In fact, a small functional monitoring group should be formed within each PA, which will include a biodiversity monitoring specialist and rangers involved in biodiversity monitoring.

²⁵ Biodiversity monitoring in the protected areas system of Georgia: practice, challenges, opportunities, NACRES, 2021

In addition, for each protected area, a schedule of field studies/observations should be developed, which will be followed strictly by rangers involved in biodiversity monitoring and supervised by a biodiversity monitoring specialist.

There is also need to distinguish biodiversity monitoring from recording of occurrence of individuals (usually fauna species) during the patrolling. Biodiversity monitoring is a regularly repeated exercise strictly following a unified methodology²⁶. Accordingly, the human resources required for the regular implementation of the studies/observations determined by the standard methodologies for selected species and habitats monitoring should be evaluated, i.e. how sufficient and qualified the existing staff of rangers are to perform this task, and accordingly additional staff should be hired.

In some cases, field studies may be carried out by invited specialists.

Protected landscapes, multi-purpose use areas, biosphere reserves, Emerald Sites

As mentioned above, as for today, 4 protected landscapes have been created in Georgia (Aragvi, Truso, Machakhela and Tusheti) and it is planned to establish another protected landscape (Tana-Tedzami). The process of establishment of Samukhi multipurpose use area is underway. Nomination of two Biosphere Reserve (Three Alazani and Dedoplistskaro biosphere reserves) has been adopted recently by the UNESCO's "Man and Biosphere" program.

In addition to the above, the Emerald Network is being developed in Georgia. A part of the territories included in the Emerald network, at the same time, is included in the different PAs under APA management. And the other part is located outside of the PAs. Biodiversity monitoring within the Emerald site located within PAs under the APA management will be carried out by the respective PA administrations. However, as for today, the legislation has not defined the responsible authorities for management (respectively, for the biodiversity monitoring) of the Emerald sites outside of PAs.

There are currently 11 permanent and 12 part-time employees in the Tusheti Protected Landscape Administration²⁷. Job descriptions are not elaborated. Biodiversity monitoring, among other functions, is included in the duties of the Agriculture and Biodiversity Monitoring Specialist. Currently, the administration does not carry out research-monitoring activities. The qualification of specialists and rangers in this field is minimal. In 2019-2022, with the support of USAID/ZRDA and CNF, specialists of Tusheti Protected Landscape were trained for using SMART program. USAID/ZRDA purchased and handed over to the administration photo traps and other techniques for biodiversity monitoring, and CNF supported purchasing of equipment for SAMRT program application.

The draft of the Tusheti Protected Landscape Management Plan includes a detailed biodiversity monitoring program, as well as a capacity building program for the administration, including biodiversity monitoring (staff requirements, relevant trainings, equipment).

In order to optimize use of scarce human and technical resources, it may be considered conduction of the biodiversity monitoring in protected landscapes, transition zones of biosphere reserves, multi-purpose use areas and Emerald sites outside of PAs, by the nearby PAs administrations. For example, administration of the Tusheti National Park may carry out biodiversity monitoring within the Tusheti Protected Landscape as well.

However, to solve this issue following will be needed:

- i. Adequate staffing of biodiversity monitoring groups in the administrations of PAs under APA management, taking into account that this groups will be responsible to carry out biodiversity

²⁶ Protected Areas Monitoring in Georgia, Technical Background Paper, Experience and Recommendations Based on European Countries Approaches, DH&P conservation, 2020

²⁷ Tusheti Protected Landscape Management Plan, Final Working Version, Project "Promoting the Financial Sustainability of the Protected Areas System of Georgia", CNF, 2022

- monitoring within the adjacent protected landscapes/multi-purpose use areas/emerald areas/biosphere reserves;
- ii. Legal authorization of the APA and PAs administrations to carry out biodiversity monitoring in the surrounding areas (outside of PAs under their management).

If appropriate resources (human, technical, financial) are available, it is possible to create a biodiversity monitoring groups in the administration of each protected landscape/multi-use area/biosphere reserve/emerald site, which should consist of at least 3 specialists: a group leader, a botanist and a zoologist, whose duty will be to collect field data according to standard methodologies and uploading them to the biodiversity information system. But, even in this case, joint planning and coordinated implementation of the biodiversity monitoring program with the administration of the nearby protected area will be important.

4.2 Capacity Building

After staffing the biodiversity monitoring coordination unit (group) at the national level, it is recommended to plan and implement relevant trainings in order to familiarize the staff with international experience and successful examples of biodiversity monitoring. In order to facilitate coordination, it is recommended to plan a joint training sessions with the specialists of BNRMD of APA. Support of an international expert in planning and conducting of the trainings will be necessary. Within the framework of the mentioned trainings, the efforts already made for the development of the biodiversity monitoring system with the support of the donor organizations and their views on the development of the system should be introduced.

At the initial stage of the development of the biodiversity monitoring system, the technical assistance of an international expert at the national level is recommended.

At the level of individual PAs, trainings on biodiversity monitoring should be held regularly. Planning of necessary trainings for individual PAs should be done on the basis of biodiversity monitoring programs. Trainings should be planned by the BNRMD in coordination with BFD. Biodiversity monitoring specialists of each PA must undergo a comprehensive training course, while rangers may attend relatively simple training courses. In order to strengthen coordination, it is recommended to conduct joint trainings of rangers from different PAs, as well as, in order to share experience, temporary exchange of rangers between different PAs is recommended.

5. Required Technical Resources

Biodiversity and Forest Department

As mentioned, the electronic data management system should be developed at the national level in order to collect, consolidate, analyze and interpret the data obtained from different sources (including individual PAs, protected landscapes, Emerald sites, etc).

Despite several attempts to create an electronic data management system for the purposes of biodiversity monitoring, no such system is functioning at the national level or at the level of protected areas.

Based on the above, it is recommended to develop an independent electronic data management system for biodiversity monitoring, which includes a module of selected species and habitats along with other indicators selected within the framework of the national biodiversity monitoring system.

The mentioned system should be compatible with the existing electronic data management systems (FIMS, Environmental Information Management System) to enable data exchange between these systems.

At the national level, a Forest Inventory and Monitoring System (FIMS) is currently being developed by coordination of BFD. FIMS is being developed with the support of GIZ's ECOserve program and is a centralized database of forest-related data that includes continuously updated information on forest management.

The environmental information management system (emoe.gov.ge) is functioning as well, which supports Environmental Supervision Department to control use of natural resources. This electronic reporting system includes modules on logging, fishing in the Black Sea, wood processing and mainly is used by entrepreneurs (holders of timber production and fishing licenses).

It is planned that BFD will be supported in the development of an electronic data management system for biodiversity monitoring by the Swedish International Development Cooperation Agency (SIDA) within the framework of the "Save Nature - Georgia" project. However, the scope of cooperation in this direction has not been clearly established yet.

At the initial stage, after establishing a Biodiversity Monitoring Coordinating Group in BFD, it is recommended to start collecting biodiversity monitoring reports and to create an electronic library. In order to enter existing data on individual species, groups of species and habitats, metadata (data about data) must first be defined, i.e. what necessary information (data) should be entered for each species or habitat. It is recommended to use open sources.

Also, the concept of biodiversity information system should be developed initially, which will define the system content, design, main groups of data, statistical functions. After, the information system software should be developed, the need for technical equipment (for example, server) should be determined and purchased. After the development of the biodiversity information system, it will be important to conduct trainings for the members of the BMCU in BFD, in matters of data entry, analysis, and statistical processing.

Along with the establishment of the Biodiversity Coordination Unit in BFD, it will be necessary to purchase appropriate office technical equipment (computers with appropriate software, printer, scanner).

Agency of Protected Areas

The implementation of the SMART (Spatial Monitoring and Reporting Tool)²⁸ monitoring and patrol system has recently started by APA, the main objective of which is to improve the quality of ranger patrols and to create a unified database on law enforcement within PAs. It is planned to use SMART software for biodiversity monitoring as well.

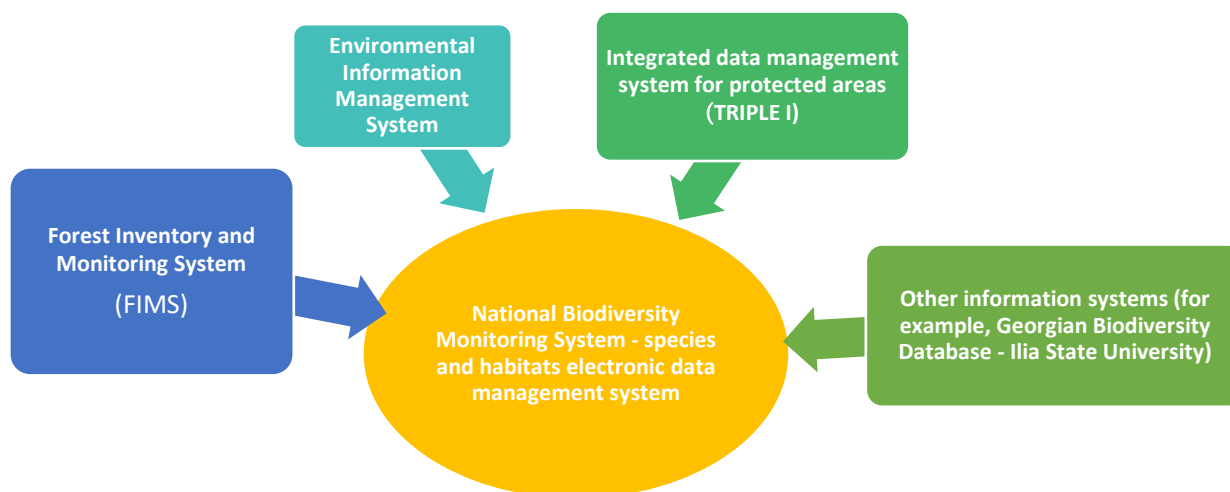
In addition to the above, it is planned that KfW will support APA in the development of the electronic data management system of species and habitats within the framework of the new project "Biodiversity and sustainable local development, Georgia/Protected Area Component". In particular, further development and refinement of the integrated management system - TRIPLE I, developed within the framework of the KfW-funded Protected Areas Support Program (SPPA), is considered. The mentioned system, together with other components, includes the accumulation of data in a unified database obtained through monitoring programs on species and habitats.

In order to avoid duplication, the development of the electronic data management system by APA should be coordinated with the development of the biodiversity information system at the national level. The mentioned systems should be mutually compatible, allow electronic exchange of data, it should be possible to archive and store data in such a format that allows consolidation with data received from other sources and unified analysis.

PAs administrations should have access to an electronic data management system at the level of the protected area system, where field data should be continuously entered and updated.

²⁸ <https://smartconservationtools.org/>

Figure 3. Electronic data management system model for biodiversity monitoring



After staffing the Biodiversity and Natural Resources Division (APA) with appropriate personnel, appropriate technical equipment should be purchased, including office equipment (computers with appropriate software, printer, scanner) and equipment for field work (cameras, binoculars, monacle).

The technical equipment required at the level of individual PAs should be determined in accordance with the species and habitats selected for monitoring.

6. Sustainability

6.1 Legal Basis

The sustainability of the operation of the biodiversity monitoring system and BMCU is significantly dependent on the existence of appropriate legislation basis.

As mentioned above, the "Rules and Procedures for the Unified Biodiversity Monitoring System" is adopted by the Order of the Minister of Environmental Protection #262 of December 18, 2012. After the adoption of the mentioned rule, the biodiversity monitoring indicators and the method of their calculation at the national level were revised several times, although the Order #262 was not amended accordingly.

The draft law "On Biological Diversity" prepared by the Ministry of Environmental Protection and Agriculture includes provisions on biodiversity monitoring. According to the current version of the draft law, an unified national biodiversity monitoring system should be created, with the purpose to assess the state of biodiversity (including individual species and habitats), identify changes and trends, their causes, and determine expected results, for planning appropriate policies and response measures. According to the draft law, strictly protected and protected species and habitats are defined as priority for monitoring. According to the draft law, the structure and functioning of the national biodiversity monitoring system should be determined by a special by-law, which will be approved by the Government of Georgia.

Adoption of the regulation "On the Unified National Biodiversity Monitoring System" is important to ensure the sustainability of the system and BMCU. However, before adoption of the draft law and the aforementioned regulation, some amendments may be made to the order #262 of the Minister of Environmental protection to create legal basis for BMCU establishment, to define information and data to

be placed in the unified electronic system of biodiversity monitoring, to identify responsibilities at national and PAs levels, to establish terms and procedures for information and data provision and accessibility.

6.1 Standardized methodologies and monitoring plans

Unified (standard) monitoring methodologies for individual species, groups of species, and habitats should be developed to ensure compatibility of primary data obtained as a result of field studies and observations. This does not exclude the use and testing of alternative methods, data obtained as a result of which can be compared with the data obtained by standard methodologies, which will contribute to the further development and refinement of standard methodologies and increase the reliability of data collected in the field.

The standard methodology of specific species/species groups or habitats monitoring should be used by all entities involved in the biodiversity monitoring system.

For the development of standard methodologies, external assistance will be required, and further appropriate trainings will be needed for personnel involved in field research, including individual PAs specialists.

It is important to coordinate the development of biodiversity monitoring plans at the national level, at the level of the protected areas system and for individual protected areas.

At the national level, the biodiversity monitoring plan should define the development stages of the system. Obviously, due to the lack of human, technical and financial resources, the national biodiversity monitoring system should be developed gradually and, first of all, the development and implementation of the standard methodologies/schemes for monitoring of the most priority species/groups of species should be started.

It is important to develop a detailed biodiversity monitoring program for individual PAs, which will include:

- Biodiversity monitoring objects (selected species and habitats);
- Standard methodology of field studies for each object;
- Schedule of field studies for each object;
- Responsible person for field studies/observations.

7. Species and habitats selected for monitoring and future scope

Selection and/or updating of priority species and habitats for monitoring should be coordinated at the national and protected area system levels. The main goal of creating each protected area is the conservation of endangered species of wild flora and fauna, as well as of the unique, rare or threatened habitats and ecosystems. Monitoring of these species and habitats (for the protection of which a protected area has even been created) at the national level should be a priority for biodiversity monitoring. On the other hand, monitoring of the economically important, indicator or threatened species and habitats selected at the national level, taking into account the country's international obligations, should be carried out in individual PAs.

Coordinated determination of the list of priority species and habitats for monitoring is important for efficient use of resources (financial, technical, human).

When selecting priority species and habitats for monitoring, the following issues should be considered:

- Why is it necessary to monitor this particular species (for example, endemic, invasive, economically important species can be selected for monitoring);
- What is the purpose of monitoring (how the data obtained as a result of monitoring will be used);

- Needed financial resources;
- Needed expertise (Is there an expert/experts with relevant competence in the country);
- Pressure (*What threats are there for the population of this species in the country*).

Monitoring schemes for each species are recommended to be based on the OECD principle - what pressures are the species' population under? (pressure) - what is the state of the population? (state) - what countermeasures are taken? (response).

With the support of CNF and intensive consultation with stakeholders, priority species for monitoring have already been selected for 12 protected areas (see Annex 3). In 2022, it is planned to monitor 8 species, as well as migrating and nesting waterfowl bird species, within Javakheti National Park, and in the future (until 2029) it is planned to increase the number of species to 21 species.

Monitoring of the following species/groups of species was recommended within the framework of the biodiversity monitoring national system, Factsheets were prepared and the data was published in the form of BioTrends with support of GIZ Ibis Program:

Species/species group	Importance for monitoring
Cetaceans	International obligations (Bucharest Convention for Protection against Pollution of the Black Sea)
Wintering water birds	International obligations (CMS, AEWA, Ramsar Convention)
Field Bird Index (Farm Bird Index)	A good indicator of the state of agricultural landscapes
Lesser Grey Shrike (<i>Lanius minor</i>)	Part of the Field Bird Index
European roller (<i>Coracias garrulous</i>)	Part of the Field Bird Index
Forest Bird Index	A good indicator of the condition of forest ecosystems
Caucasus Salamander (Salamander)	Endemic species
<i>Galanthus</i>	International obligations CITES
<i>Cyclamen</i>	International obligations CITES
Hunting species	Regulation of hunting, however, a new legislation regulating hunting needs to be adopted

Source: Georgia's New NBMS, An Introduction, Salome Nozadze, Christian Gonner, November, 2022

It is recommended to compare and prioritize lists of priority species for monitoring at national and protected areas level.

8. Action Plan

The action plan is presented as an attached Excel file.

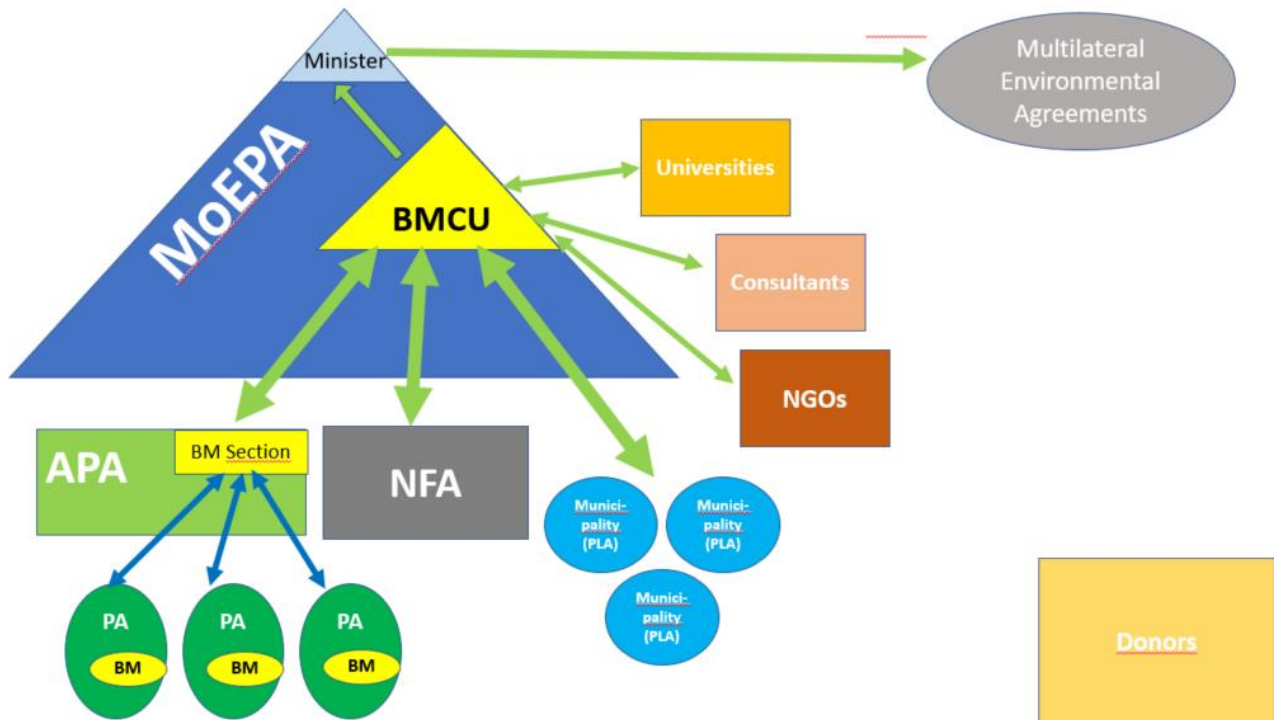
Annex 1. List of stakeholders consulted

(Communication was carried out through personal meetings, telephone, Skype or Zoom)

1. Tamar Pataridze, Tea Barbakadze, Tania Rosen, Tobias Miunchamier, Caucasus Nature Fund (CNF);
2. Maka Bitsadze, WWF Caucasus Program Office;
3. Toma Dekanoidze, Agency of Protected Areas;
4. Carl Amirgulashvili, Biodiversity and Forest Department, Ministry of Environmental Protection and Agriculture.
5. Teona Karchava, Division of Protected Areas, Biodiversity and Forest Department, Ministry of Environmental Protection and Agriculture;
6. Salome Nozadze Division of Protected Areas, Biodiversity and Forest Department, Ministry of Environmental Protection and Agriculture;
7. Nona Khelaia, Division of Biodiversity, Biodiversity and Forest Department, Ministry of Environmental Protection and Agriculture;
8. Shalva Nozadze, Forest Policy Division, Biodiversity and Forest Department, Ministry of Environmental Protection and Agriculture;
9. Irakli Goradze, UNDP;
10. Irakli Shavgulidze, NACRES;
11. Eka Kakabadze, Biodiversity and sustainable local development, Georgia/Protected Area Component, KfW;
12. Christian Gonner, GIZ.

Annex 2. Organizational chart of institutional arrangements for biodiversity monitoring

(model selected at the first stage of research)



Annex 3. List of priority species for biodiversity monitoring in protected areas

Species	Protected Area
Brown bear (<i>Ursus arctos</i>)	ALGETI NP
	MTIRALA NP
	MACHAKHELA NP
	KINTRISHI PA
	VASHLOVANI PA
	PSHAV-KHEVSURETI PA
	LAGODEKHI PA
	KAZBEGI PA
	TPA & TPL
	BORJOMI-KHARAGALI
Bezoar goat (<i>Capra aegagrus</i>)	TPA & TPL
	PSHAV-KHEVSURETI PA
East C. tur (<i>Capra cylindricornis</i>)	TPA & TPL
	PSHAV-KHEVSURETI PA
	LAGODEKHI PA
	KAZBEGI PA
Red deer (<i>Cervus elaphus</i>)	TPA & TPL
	LAGODEKHI PA
	BORJOMI-KHARAGALI
Eurasian lynx (<i>Lynx lynx</i>)	VASHLOVANI PA
Goitered gazelle (<i>Gazella subgutturosa</i>)	VASHLOVANI PA
Ungulates: chamois and roe deer	MACHAKHELA NP
	MTIRALA NP
	KINTRISHI PA
Bearded vulture (<i>Gypaetus barbatus</i>)	KAZBEGI PA
Eurasian griffon (<i>Gyps fulvus</i>)	KAZBEGI PA
Vultures: Egyptian vulture, Griffon	VASHLOVANI PA (Eagle canyon)
Black stork (<i>Ciconia nigra</i>)	VASHLOVANI PA (Eagle canyon)
Pheasant (<i>Phasianus colchicus</i>)	VASHLOVANI PA
Caspian Snowcock (<i>Tetraogallus caspius</i>)	BORJOMI-KHARAGALI
Caucasian grouse (<i>Lyrurus mlokosiewiczi</i>)	BORJOMI-KHARAGALI
Velvet scoter (<i>Melanitta fusca</i>)	BORJOMI-KHARAGALI (Tabatskuri)
Great rosefinch (<i>Carpodacus rubicilla</i>)	KAZBEGI PA
Guldenstadt's Redstart (<i>Phoenicurus erythrogastrus</i>)	KAZBEGI PA
Migratory water birds	JAVAKHETI PA
Nesting colonial water birds	JAVAKHTI PA
Rubby shelduck (<i>Tadorna ferruginea</i>)	JAVAKEHTI PA
Common crane (<i>Grus grus</i>)	JAVAKHETI PA
Woodpeckers	PSHAV-KHEVSURETI PA
	BORJOMI-KHARAGALI

Caucasian salamander (<i>Mertensiella caucasica</i>)	MACHAKHELA NP
	MTIRALA NP
	KINTRISHI PA
	BORJOMI-KHARAGALI
Trout (<i>Salmo spp.</i>)	MTIRALA NP
	KINTRISHI PA
	TPA & TPL
	PSHAV-KHEVSURETI PA
	BORJOMI-KHARAGALI
Benthic macroinvertebrates and fish composition	JAVAKHETI PA
	BORJOMI-KHARAGALI (Tabatskuri)
Forest (permanent plots)	ALGETI NP
	MTIRALA NP
	KINTRISHI PA
	MACHAKHELA NP
	TPA & TPL
	LAGODEKHI PA
Pastures	VASHLOVANI PA
	ALGETI NP
	JAVAKHETI PA
	TPA & TPL
	PSHAV-KHEVSURETI PA
	LAGODEKHI PA
	KAZBEGI PA
	BORJOMI-KHARAGALI (Ktsia Tabatskuri)
	BORJOMI-KHARAGALI
Invasive plants	MTIRALA NP
	KINTRISHI PA
	LAGODEKHI PA