



**Institutionalization of climate change adaptation
and mitigation in Georgian regions**

**BASELINE ASSESSMENT OF CLIMATE CHANGE ADAPTATION AND
MITIGATION PRACTICES ON LOCAL LEVEL IN GEORGIA**

First Draft

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1 Background

The present study has been implemented by the National Association of Local Authorities of Georgia (NALAG) in the framework of USAID funded project Institutionalization of Climate Change Adaptation and Mitigation in Georgian Regions (ICCAMGR).

The NALAG is a non-governmental, non-profit and non-political organization, which unites all entities of local self-governance of Georgia. It aims at promotion of the local self-governance, enhancement of local democracy and development of the self-governance institutions.

Institutionalization of Climate Change Adaptation and Mitigation in Georgian Regions (ICCAMGR) is a 4-years long program designed to support climate change adaptation in regions of Georgia through institutionalization of climate change adaptation and mitigation measures at local and national levels by building of capacities of local authorities. The project covers the 65 municipalities of Georgia.

2 ICCAMGR Project and baseline assessment of existing situation

The present report provides summary analysis of the Baseline Study carried out in the all municipalities of Georgia, performed within the scope ICCAMGR program supported by USAID and implemented by the National Association of Local authorities of Georgia (NALAG). The Baseline Study was performed to assess the situation regarding climate change in the municipalities, as well as evaluation of activities performed at the municipal level to address climate change issues. The detailed information regarding activities performed within the Baseline Study and achieved results are described in chapters below.

2.1 ICCAMGR PROGRAM GOALS AND OBJECTIVES:

The overall Goal of the Program is fostering of climate change adaptation measures in regions of Georgia through institutionalization of climate change adaptation and mitigation at local and national levels by building of capacities of local authorities.

The Project Objectives are as follows:

- 1 Fostering climate change adaptation and mitigation through establishment of institutional and organizational capacities for the local authorities;
- 2 Promotion of climate adaptation and mitigation measures at the local level and consideration of climate change related local problems in related national policy;
- 3 Involvement of local authorities of Georgia in discussion and decision-making on climate change at the local, national and international levels;
- 4 Ensuring sustainability of existing climate change adaptation and mitigation measures at the local level.

3 Goal and Objectives of Baseline Study

The main goal of the Baseline Study was to collect the information from all the municipalities of Georgia, analyze collected information in order to describe the existing situation in the municipalities, verify the trends in the fields related to climate change, describe existing problems related to geo-hazards, agriculture, forestry, exploitation of natural resources, anthropogenic impacts, etc. In addition to abovementioned, the Study covered collection and analysis of information regarding institutional capacities in place and measures undertaken at the municipal level to combat climate change problems, e.g. projects implemented to address climate change adaptation and mitigation in the municipalities.

As the municipalities, subjects of the Study, significantly differ in terms of size, existing problems, economic situation, etc., methodology of the study was developed to allow grouping, clustering and standardize information collected and later assess collected semi-quantitative or qualitative information using rating method.

The activities for elaboration of the methodology included:

- Collection of available data regarding current situation in the municipalities regarding situation on following fields:
 - The general information regarding territory of municipality, main activities, land use pattern, agriculture (crop growing, cattle breeding, irrigation and drainage), forest resources, water resources inclusive surface/underground reserves and it's consumption, geo-hazards, erosion etc.
 - The data regarding human activities: industry, exploitation of natural resources, condition of municipal infrastructure, water supply, waste management, economy, etc.;
 - The information regarding development plans and strategies for municipal development, etc.
 - The information regarding social sector, population, main fields generating income for local population, gender related issues, etc.;
 - The information on existing capacities of municipalities related to tackling of climate change.
- Identification of main issues which make municipality vulnerable to climate change, their plans for economic development, extent of climate change adaptation issues, etc.
- Analysis of collected information, preparation of the reports, creation of the overall picture on current climate adaptation and mitigation measures practiced at the local level in each municipality, assessment of vulnerabilities in accordance to the discussed sectors, etc.
- Identification of sectors, where the main problems are recorded, and areas which will be most impacted by climate change.
- Assessment of local authorities awareness regarding challenges related to climate change and its consideration in current operation;
- Assessment of capacity of municipal structures related to addressing climate change mitigation/adaptation and extend of climate change consideration in municipal planning.

4 Approach and Methodology

To elaborate and tailor methodology to the needs and objectives of the Baseline Study, the following steps were undertaken:

- Elaboration of questionnaire (2 versions: rural and metropolitan municipalities), semi-structural ones.
- Testing of questionnaires and methodology in two municipalities (rural and metropolitan);
- Selection and training of experts for collection of information;
- Filling in the questionnaires by municipality staff (mostly quantitative information)
- Organization of focus group meetings in each municipality;
- Filling in the questionnaires during the focus group discussions;
- Drafting of reports for each municipality ;

- Generalization of collected and analyzed information, grouping by key problems, assessment of significance of existing and expected problems by sectors.

Considering, experience of other projects/programs, ICCAMGR decided to choose descriptive methodology on the basis of semi-quantitative and qualitative information, as most suitable for collection of complex information at the local level. In addition, the selected approach provided opportunity to rise awareness on climate change issue among the municipality staff and local experts during semi-structural interviews and discussions in the focus groups.

5 The Baseline Study process

5.1 Evaluation of the questionnaire

The main tool used for the Baseline Study was detailed questionnaire (annexes 1 and 2) prepared by the ICCAMGR team, to be filled in a) by the staff municipalities and b) during focus group discussion with local specialists in each municipality.

The questionnaire tailored specifically for present Baseline Study covered the above listed sectors; specific section was dedicated to each subject like agriculture, geological processes, industry, development, etc. The questions were addressed towards identification of problems which might become severe due to climate change or are caused by climate change. Certain set of questions was devoted to local actions which could be interpreted as measures addressing climate change adaptation and/or mitigation. Cross-cutting questions were used for enable better interpretation and cross checking of collected information.

The program team tried to make the questionnaire easy for understanding. Also it was considered, that the same questionnaire can be used by the municipalities in the future as an effective tool for analyzing the information on site and effectively assessing real problems and trends within municipality.

Despite all attempts, to simplify the questionnaire, it still remained pretty long as far as all sectors had to be included. While preparation of questionnaire, it became clear, that the required information could not be collected with face-to face interviews, and quantitative data had to be based on other documentation. According to abovementioned, the representatives of municipalities have been asked to collect and fill up statistical and quantitative information.

The special version of the questionnaire was prepared for cities, where the sections dedicated to agriculture was significantly reduced and sections related with infrastructure, planning, transport,

industry, etc. was significantly expanded. This version of questionnaire was dedicated for studies in major cities of Georgia: Tbilisi, Rustavi, Kutaisi, Poti and Batumi.

5.2 Testing of questionnaire in pilot municipalities

The prepared questionnaire was tested in the municipalities of Dusheti (questionnaire for rural areas) and Rustavi (questionnaire for the cities). The documents were sent to municipalities, asking to fill-up required information and prepare the document for local experts' group discussion. Prepared documentation and experts' group meetings were organized by ICCAMGR staff, in order to test questionnaire.

While piloting the questionnaires in the two municipalities, it became clear that quantitative information regarding the specific fields related to climate change could not be collected. The questionnaire was updated taken into consideration experience learned in pilot municipalities. The updated questionnaire became more focused on collection of semi-quantitative information which provides indication of problem significance, its extent and context.

5.3 Selection and training of experts

Eight experts were selected to lead the local specialists' group meetings in the municipalities, collect information in line with the questionnaire, analyze collected data and prepare summary reports for the municipalities. The Georgian regions have been split in following regions: Shida Kartli, Kakheti, Kvemo Kartli, Samtskhe –Javakheti, Guria, Adjara, Mtskheta-Mtianeti, Racha-Lechkhumi, Kvemo svaneti and Samegrelo - Zemo Svaneti regions. Selected experts, dedicated for each region participated in the training session specially organized at the NALAG office.

The experts were trained to collect information available at the local level. The main target was proper collection of information from individuals working in relevant fields, having experience and knowledge of the municipalities. Each portion of information had to be verified during the group discussions in the municipalities, and corrected in order to reflect the real situation as much as possible, even in the situations when the accurate or statistical data is missing.

The updated questionnaire was discussed in detail during the training of experts. Experts opinion was considered during the session and minor changes have been made in final documents in accordance to expert's position and advise. This was very important exercise, as far as the selected experts had experience working in the different regions, and their advises were based on specific regional experience. The final version of questionnaire was adopted at the end of training session.

5.4 Completing the questionnaires by municipality staff

The final version of questionnaires were provided to the experts and was sent to municipalities with request to fill-up required information in each section. The municipality staff was also asked to prepare quantitative information in advance, i.e. before the focus group meetings.

5.5 Organization of the Focus Group (local specialists') meetings in each municipality;

The municipalities, i.e. focal points of ICCAMGR, have been asked to organize the meetings with participation of local specialists. The main criteria for local specialist selection was knowledge and experience in fields of agriculture, economic development, forest and waste management, etc. The specialists groups were selected by the municipalities.

4.6 Filling in the questionnaires during the Focus Group discussions

The meetings with local specialists were conducted in each municipality by ICCAMGR experts. The filled questionnaires previously prepared by municipal staff was discussed at the specialists' group meeting in order to correct the data presented, discuss sources of data and reliability of statements.

The information collected included following:

- the situation in sectors which could be affected by climate changes and/or aggravate as result of climate change;
- the actions already implemented in municipalities related to climate change or which may be considered as measures undertaken for climate change adaptation or mitigation;
- awareness of local authorities about challenges related to climate change;
- capacity of local authorities to identify and address these challenges in the municipalities.

Based on above mentioned, specific topics discussed and analyzed as part of the Baseline Study process was following:

- General data regarding municipality;
- Climate conditions;
- Natural disasters and hazards
- Agriculture
- Forestry
- Hydrology and water resources
- Coastal processes

- Pollution prevention
- Industries and industrial development
- Waste management
- Gender related issues
- Municipal development strategies and plans
- Current local level adaptation measures
- Capacity of local authorities to address climate change challenges

5.6 Drafting of reports for each municipality

The data, collected and verified during the Focus Group discussions was analyzed by the experts responsible for report preparation for each municipality. As mentioned, the main focus was on interpretation and analysis of raw data collected. Very important issue was to interpret sections of the questionnaire where the information was not available, or information was incomplete.

Experts prepared the draft reports for each municipality. The reports included description of main problems by sectors, as was included in the questionnaire, and evaluation of significance of each topic on municipality wide scale. The draft reports also included experts opinion regarding existing trends, changes observed in each target sector, and need of urgent actions.

Each report was discussed within the ICCAMGR team members and final corrections were implemented in each report. Each report prepared for municipalities was analyzed in detail and the information received was verified with available publications and reports prepared by the other institutions during last few years. It should be mentioned, that available published data is mostly included in several reports devoted to climate change and natural hazards risk assessment. The main studies implemented were:

- the Second National Communication of Georgia to UNFCCC (2009),
- Natural hazards maps of the National Environmental Agency,
- Atlas of Natural Hazards and Risks of Georgia by CENN (2012);

In cases, when the major discrepancies were identified between the Focus Groups information and available publications, the data was verified and most reliable (in our opinion) data was included in final versions of reports.

All reports for municipalities in Georgian are attached in Annex 3.

5.7 Generalization of collected and analyzed information, grouping by key problems, assessment of significance of existing and expected problems by sectors.

The analysis of prepared reports was carried out in order to extrapolate collected information from conducted baseline assessment.

The reports for all municipalities have been reviewed by the ICCAMGR team. The information was analyzed sector by sector, in order to assess the trends if they were identified. The thematic maps have been prepared practically for all sectors. The GIS systems have been used in order to visualize the findings from baseline assessment and simplify understanding of climate related issues.

The data from each report was grouped sector by sector and significance or importance indexes were applied for each municipality. The five point scoring systems were used to interpret the situation for each sector in each municipality; systematic comparison analysis approach was used during the evaluation. The scores have been incorporated in GIS model prepared. After the thematic maps were prepared, the summary index was calculated and summary baseline map was prepared.

The results of analysis are presented in conclusions and recommendations chapters of the present report. The maps are also attached.

6 Findings

The section represents main findings based on conducted Baseline Study. Many similarities were found between the municipalities in terms of available information, understanding of climate related issues and capability to assess and plan activities with climate change considerations. In general information available within the municipalities is very limited and unclear. The reasons for such situation is lack of resources at the local level, unclear responsibilities in existing structures and insufficient coordination between different governmental structures.

Most problematic areas identified during the Baseline Study are agriculture, natural hazards, forestry and water resources management. The main findings of study can be generalized as follows:

Awareness and Capacities to tackle Climate Change

The awareness level related to climate change at the local level varies between the municipalities, however, in general the awareness level is very low. During the discussion of climate change, risks are considered as important, but in reality the understanding of actual possible implications related to climate change and possible effect on local economy, welfare is not considered. The municipalities do not have structures or individuals working on environmental or climate change issues, and have no capacities to incorporate its considerations in local planning.

The information regarding existing situation is also very limited, in most cases available information is based on old existing data and is not updated taking into account present situation and changes in activity profile within the municipalities. In most cases, the information regarding situation in agriculture sector is not analyzed and trends regarding the soil fertility, kettle breeding, crop growth, etc. is not known.

The incorporation of environmental and climate change considerations in the economic development is also at a very low level, accordingly the majority of municipalities are not prepared to adapt to climate change.

Agriculture Sector

Georgia is an agricultural country and main income source for rural population is agriculture sector; though, farming in the country is mainly subsistent due to lack of financial resources, irrigation water, knowledge about proper farming practices, etc. On the other hand, inappropriate farming practices, usage of traditional farming practices, low level of intensification and land fragmentation lead to unsustainable development of the sector, as adversely impacted land resources, water resources and

environment in general. For example, many municipalities suffer from overgrazing, agricultural land degradation due to uncontrolled applications of agrochemicals and improper irrigation, etc.

The baseline study has indicated, that the agricultural sector is rather vulnerable to climate change, as adaptation needs are not considered in practice. As a result of the Baseline Study, the agriculture sector vulnerability map was prepared. The five point scale used to indicate overall index of municipality in terms of agricultural issues. The rating was based on fertile agricultural land loss, overexploitation, salination, desertification and other quantitative parameters. The qualitative indicators were also considered, because in some cases the loss of agricultural land is not indicated, however, productivity was lost. The difficult issue is related with interconnection of sectors; the lack of irrigation can cause loss of product quantity, and this can be not related with loss of agricultural land, however this is still sector problem as well as problem related with water management and effective water use.

The map indicates that problems are increasing in central part of the country and towards to the East. In highland municipalities the factor of intensive agriculture is very low. The land resources are available, accordingly, agricultural sector in those municipalities are less sensitive to climate change than lowland municipalities like Dedoplistskaro. The ratings given on the map can not be accurate, because it indicates general situation which is summary of number of factors. The indexes given just indicate the overall situation and in some cases are related only to crop growing or cattle overgrazing. The index can be used for grouping of municipalities with similar risks and needs for action. The Agriculture Vulnerability Map is presented below.

In order to present more precise data, the information regarding land loss was presented on separate map. Again five point scoring system was used to extrapolate collected data at the municipal level and assign the score indicating significance of land loss. The results of evaluation are presented on the Map on Agricultural Land Loss (see Map 2.)

Similar map was produced in order to assess the significance of problems related with cattle breeding / overgrazing. The municipalities, where the number of cattle is high, while pastures territory is not sufficient to avoid overgrazing, were assigned higher score. The consideration of trends, which can affect overall vulnerability of sector to climate change was not possible due to incomplete data available in the municipalities. The results of evaluation is presented on Map 3.

Forestry

Forest resources are managed the National Forestry Department, therefore are not the property of municipalities, accordingly the municipalities can not manage the resource, however they can recommend or demand some actions to be considered by the Forestry Department of Georgia or other

relevant agencies. As far as the municipal forests does not exist, the local government structures do not have detailed information about local forest resources.

However, it was possible to collect some information regarding forest resources in the municipalities and its exploitation. This data could not be verified by the Forestry Department of Georgia, but is based on knowledge of local specialists and statistical data available in the municipalities. The reports prepared include the information regarding forest resources within the municipality, general problems related to forest resource degradation, overexploitation, etc. The specific map depicting state of forest resources in municipalities, as well as significance of forest degradation, overexploitation, insufficient management, etc. was produced. Again five score system was used to evaluate the situation. The municipalities with potential problems related to forest resource loss are assigned higher scores (See map 4).

Natural Disasters and Hazards

Conducted Baseline Study included evaluation of situation within municipalities related to natural disasters and hazards. It is very difficult to assess the vulnerability of specific municipality to natural disasters and hazards because of difficulty to extrapolate of data to whole municipality, consideration risks significance. In some cases number of sites is high, however, they are of small scale; in other cases number is small but the affected area is large. Based of collected information and baseline reports it was possible to assign summary indexes to each municipality. The 5 point scale, was also used to indicate the significance of geo-hazards and potential of natural disaster occurrence; the are lots of quite expansive areas throughout the country under medium to high risk of different type natural hazards due to complex relief and geologic conditions. The mentioned risks are often increased due to human interventions, such as: unsustainable use of natural resources including forest logging, extraction of inert materials from river courses, overgrazing, etc. and improper infrastructural development (i.e. construction in high risk zones).

Local authorities mostly do not keep track-records about natural hazards and the damages caused. Therefore, they mostly have a general picture on severity level of natural hazards in their municipalities. Comprehensive information about past natural hazards, damaged areas and infrastructure, financial losses, areas under the risk, etc. is not available at the local level. The only indicator available at the local level was information regarding money spent on natural disasters consequences liquidation during the last few years, and number of inhabitants affected by the disasters and geo-processes within the municipality. In addition, municipalities do not have spatial planning in place, municipal development occurs chaotically, which even increases risks related to natural hazards.

The Natural Disasters and hazards risk map was produced to present the data collected during the study (See map 5).

Hydrology and water resources

The assessment of baseline situation indicated, that sufficient water resources are available in most parts of the country and water problems are not of high priority at the moment, however, water resources are generally poorly managed. This includes improper management of river courses (extraction of inertial material, improper bank protection measures, etc.), water pollution, ineffective and poorly planned water use, etc. Unsustainable management of water resources is likely to lead to restriction of sufficient safe water. This issue is likely to be aggravated due to climate change, which according to predictions, will notably affect water availability meantime then water demand is likely to increase due to socio-economic development and increased droughts.

The municipalities mostly don't have sufficient information on water resources available for local use, water demand and water consumption in their municipalities. Very limited adaptation measures are applied in water management sector at the local level. These mainly include rehabilitation of irrigation and water supply systems. In some settlements with centralized water supply system water meters are used, enabling demand control.

Due to current and potential problems, as well as lack of sustainable management and adaptation measures water resources are among the priority issues making municipalities vulnerable to climate change.

The special map was prepared to represent water related issues within the municipalities. The scale used is also based on five point scoring system. The scores have been assigned to the municipalities in accordance to complex of indicators, water availability, existence of irrigation/drainage, access to drinking water, etc. (See map 6).

Anthropogenic impacts

The anthropogenic impacts in the country can be divided into a) impacts from industrial sector and b) infrastructure inclusive municipal services. The waste management is at poor level throughout the country and can be considered to be at the similar level in all municipalities except large cities. Solid waste management is mainly limited to waste collection from relatively larger settlements and disposal to *official* landfills; Through, the major issue is safe disposal of collected waste as soon as practically all landfills are in poor condition. Improper waste management causes environmental pollution and respectively, degradation of land and water resources and leads to food and water insecurity.

Current small improvements in waste management include improved solid waste collection from relatively large settlements and rehabilitation of sewage collectors as part of the infrastructure

rehabilitation program. The data collected during the Baseline Study indicates, that information available in all municipalities is focused on municipal centers (main cities of the municipalities) and extrapolation of problem to whole territory is very difficult. The problem is also assignment of scores in accordance to the significance of problems. The significance can be considered as equal except for municipalities with very low population. Another issue is location of landfills and how the problem should be addressed, as soon as the municipalities are not large and quantity of generated household waste is not adequate in term of the quantity of waste sufficient for construction of *quality* landfills, so the issue will raise up regarding the transportation of wastes between municipalities and creation of shared landfills for neighboring municipalities.

The situation with waste water treatment is also very poor. Relatively larger settlements are provided with sewage collectors, however, they lack treatment systems or treatment systems are not able to operate at required level.

In large cities the issue of air pollution is very important, which was not the case in rural municipalities except the ones with specific large scale industries. The atmosphere air pollution in the cities are related mostly with transport as far as the small and medium size industrial facilities are not operating or operate at a low production rate. Specific measures addressing the mentioned issues can be considered in the cities such as Tbilisi, Kutaisi, Poti, Batumi and Rustavi.

Specific attention was given to industrial facilities; as it was expected the situation in Rustavi, Gardabani, Zestaphoni, Kaspi, Poti and Tkibuli is difficult due to the significant air pollution from large scale industrial enterprises. Those municipalities have to consider the industrial pollution in the municipal centers separately from the issues identified in rural non industrial areas, as usual impact zones of pollution is 3 km.

Gender related issues

Understanding of gender related issues is very low. It is known, that women are more affected by the climate change than men. During the Baseline Study it was not possible to identify the specific issues related to gender equality. In most of the cases, the group discussion was not able to indicate that municipality understands importance of gender related issues. Special activities are needed in order to support consideration of gender and it's importance in climate related issues.

Current Local Level Adaptation Measures

Some of the projects implemented at the local level could be considered as climate change adaptation measures, as far as they were focused on water efficiency and security, food security, flood

management, etc. These actions mostly include infrastructural improvements such as rehabilitation of water supply and irrigation systems, construction of bank protection structures.

The Baseline Study in some municipalities these measures were not effective due to improper design or approach. For example, many municipalities stated that water supply systems headwork facilities fail during flooding. In many cases gabions cannot ensure effective flood protection, etc.

Improved waste collection could be also ascribed to adaptation measures, as ones reducing water and land pollution potential; however, very limited improvement has been made in this regard.

Certain actions are also made towards agricultural development, which would increase food security. Such actions include establishment of local level agriculture development services, introduction of high productive plant and animal species, establishment of agricultural material shops and consultation centers. It is expected that performance in agriculture sector will increase. However, those facilities do not consider climate change risks under their activities.

It should be stated that local authorities have very passive position regarding the works to be implemented in the fields related with climate change adaptation. This means that actions are proactive and mostly rely on implemented works related to rehabilitation of infrastructure and mitigation of disaster effects, like bank protection, support of population in repair of damaged houses, etc. The activities are implemented in accordance with the funds received from central government dedicated for specific tasks. The local municipalities should be more active and should try to implement preventive measures against natural processes within the municipal territory.

Some municipalities have been involved in programs and projects focused on climate change funded by the donors and implemented by local or international NGOs, however, the information available about those projects is insufficient and follow up activities are not ensured after the projects are finished.

Local Governance

Capacity of local government was assessed based on information provided by the municipalities. The capabilities of local staff is very low, understanding of climate change importance is usually in place but mostly it is only statements, while in reality is not supported by the specific activities either in data collection or actions implemented.

In result to all abovementioned, the municipal structures are very weak and their capabilities do not allow addressing local level challenges and planning/promoting adaptation measures. It should be stated, that the capabilities of local municipalities should be increased. Also it is very important to establish system for collection of information and monitoring of activities within the municipalities,

which will create basis for analysis of the data and planning appropriate climate change adaptation measures in the future.

7 Conclusions

The main conclusions of performed Baseline Study are provided in the section. As it was mentioned previously, the main target of the Baseline Study was reached, as far as collected information provides understanding of climate change adaptation/mitigation activities implementation status in the municipalities, enables to understand local capacities related to tackling climate change problems at the local level and identifies priorities for further actions design.

It is clear, that **awareness raising** activities on climate change issues among local authorities and local population is absolute precondition for combating climate change in Georgia. The increase of awareness level will enable local governance institutions to identify present and future challenges; as well as to build capacities of municipalities to react on problems.

However, this problem can be split into two blocks: general awareness raising among local population and capacity building of target groups. In this regard **capacity building** of local authorities is considered as a priority as they are both a) decision making and b) management bodies in the municipalities. At least one person in each municipality should clearly understand climate change phenomena, its implications and, last but not least its expected or possible impact on particular municipality.

The very important issue is **availability of information** at the local level, this includes statistical information, the data regarding already implemented activities, data related to development of specific activity sectors within the municipalities, monitoring data, data regarding already implemented projects, etc.

The systematization and clustering of available information is very important, as far as the character of information available is very broad and includes the data collected from different sources. The systematic data processing will enable municipalities and countrywide structures to generalize the existing situation and evaluate the existing trends. The databases can include information regarding sectors such as agriculture, water, land and forest resources, records on natural hazards and related losses, etc. to enable timely estimation and prevention/mitigation of potential hazards. So the systematization of information should be target and topic oriented to simplify it's usage. At a first stage, the elaborated under ICCAMAGR questionnaire is good basis to start regular update of information and its systematization within municipalities. Considering the fact, that the questionnaire was elaborated in consultation with experts of the Third National Communication of Georgia to UNFCCC, i.e. it is in complacence with methodology used for collection of information for the National Communications, it could be concluded that information collected and systematized trough application of the questioner

will be useful not only for municipalities themselves but also for other stakeholders like different national governmental agencies and non-governmental organizations. Therefore, it could be used as the Monitoring Scheme in the municipalities.

The following important issues identified are the **need for coordination of activities** among different stakeholders and **consistent actions** to tackle climate change problem in the regions of Georgia. It is worth mentioning, that in some municipalities where climate change related projects were implemented, awareness level about the problem is higher than in others. However, projects implemented don't have systematic character and in most cases are implemented as pilot projects.. Coordination and consistent activities are needed not only at the local level, i.e. within the municipalities, but at the regional and national level as well.

Need for **integration of climate change consideration in development strategies** and **long-term planning of consistent measures to combat climate change and its impacts** is another issue to be considered. At a first stage, the last could be more sufficient to tackle existing impacts of climate change within municipalities, especially due to the fact that often there is not only lack of development plans or strategies for municipal development, but also lack of vision for municipality development in long-term. According to responses in focus groups main areas of economic development in municipalities are declared at the national level economic sectors: agriculture, tourism, renewable energy and infrastructure development. However, even in those sectors there is no clear comprehensive vision on how they should be developed at the local level. Therefore, it is very hard to predict future impacts of climate change or consider climate related risks in development. These problems should be considered not only at the municipal but at the national level as well.

Therefore, as the first step, ICCAMGR recommends to focus the planning of **measures to combat climate change and its impacts** in the following directions:

Planning and implementation of measures addressing natural hazards:

- Land use master plans considering natural hazards risk assessment should be developed for each municipality. To achieve these municipalities should obtain risk assessment and forecast reports covering their territories to use provided information during the planning.
- Municipalities should recover wind break belts. Besides, they should find ways of cooperation with forestry department to facilitate gradual reforestation of areas where forest cover was lost due to various reasons, as well as afforestation of erosion/landslide prone areas.
- Municipalities should be became more involved in river management and explore what hazards could be imposed to them in case of improper river management. They should cooperate with institutions issuing licenses on water, water related infrastructure development and inert material extraction to be adequately informed and involved in license granting process. This could be done through informing licensing agency about hazards and risks identified in their territories in respect of river course and bank dynamics.

- According to modern approach, engineering structures are not preferred flood and river bank protection measures. Therefore, municipalities should assess the efficiency and side effects from construction of bank protection structures, as well as estimate possibility for application of alternative, non-structural solutions and efficiency of such solutions.

Facilitation of sustainable development of agricultural sector:

- Municipal authorities should actively cooperate with local agricultural development service structures so that to commonly identify problems which could make agriculture sector vulnerable to climate changes and find respective adaptation solutions.
- Advanced irrigation methods should be promoted to ensure water sufficiency and effectiveness for this sector. Besides, these methods prevent soil erosion and salinization.
- Local level programs to tackle overgrazing should be developed commonly by local authorities and agriculture development service units to address this issue, which is widespread throughout the country.
- Specific activities can be dedicated to support sustainable pasture management practices in order to increase their productivity;

Improved water resources management at the local level:

- Local authorities should demonstrate interest and collect information about water use in general and in various economic sectors, water use efficiency in this sectors and water related problems to enable development of water management plans. Water use efficiency for sectors could be assessed using countrywide and worldwide benchmark data.
- Water pollution measures including improved waste management could be implemented on local level to increase water safety and ensure protection of surface and groundwater sources.
- Water consumption efficiency could be increased through further rehabilitation of water supply and irrigation systems. These should be supplemented with advanced irrigation methods.
- The situation with waste water management should become one of the priorities, as soon the impact of wastewater discharge on surface and groundwater bodies is significant. The active cooperation with infrastructure development structures in order to improve performance with wastewater management at the local level is needed.

Improved waste management:

- Local authorities should demonstrate interest and collect information about waste management issues. Important is to expand the network for household waste collection and in remote places to organize the waste collection points.
- The strategic decisions together with relevant national authorities has to be made in order to improve the waste management.
- The active cooperation is required between neighboring municipalities in order to solve waste related issues jointly. Special attention should be paid to spatial organization of landfills.

Coordination of activities between institutions and promotion of information exchange between them:

- Management of water, forest and some other natural resources is out of competence of municipal authorities. However, involvement of local authorities in the resource management process is necessary for integrated and sustainable management. Due to this local authorities should demonstrate interest to be involved in decision making of institutions responsible for natural resources management. Effective information exchange between local authorities and decision makers at the national level should be ensured.

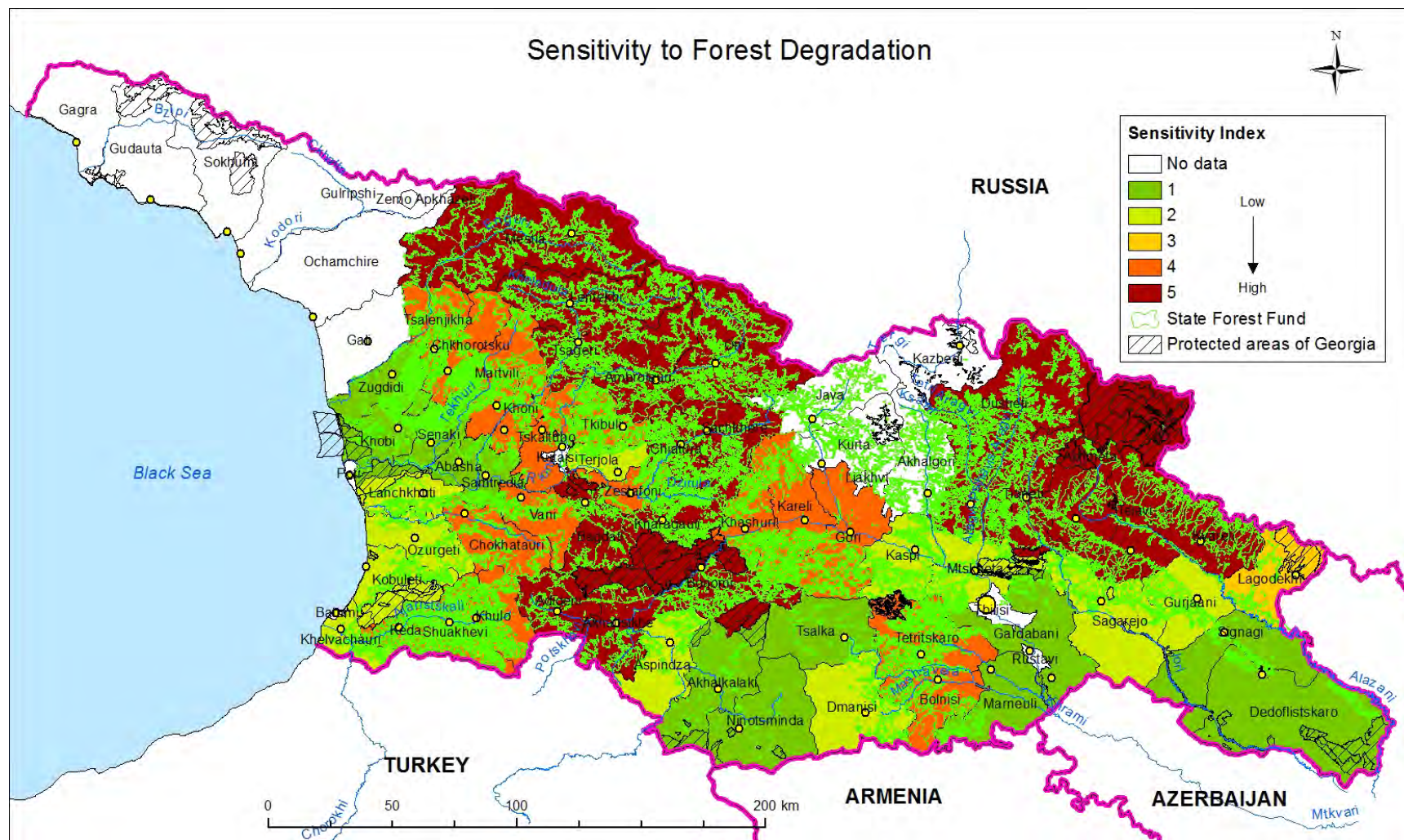
Industry sector:

- The local authorities should take proactive role in terms of industrial sector monitoring. The active cooperation with countrywide government structures is required, to ensure, that the municipality interests are respected and adequate mitigation measures are implemented by the industrial facilities. The strong cooperation between neighboring municipalities is also required to ensure, that the impacts on neighboring municipalities are also addressed.

Gender equality:

- Gender equality should be promoted in the municipalities in general. To ensure consideration of different impact of climate change at women actions not only at the municipal but also at the national level should be ensured. To support fostering gender considerations related to climate change integration at the municipal this issue should be considered in different pilot project implemented at the local level. Also awareness rising activities should be planned.

Map 5 Forest degradation map



Map 9. Anthropogenic Pollution Index Map.

