Republic of Albania
Ministry of Agriculture and Rural Development

Water Resources and Irrigation Project
Project ID P121186

Consultancy Services:
Environmental and Social Impact Assessment, Resettlement Policy and Baseline Surveys

Photo: Murriz Thana Reservoir

ENVIRONMENTAL AND SOCIAL FRAMEWORK DOCUMENT (ESFD)

CEIA

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ACRONYMS AND ABBREVIATIONS

ALL	Albanian Lek
ARB	Authority for River Basins
BWA	Basin Water Agencies
BWC	Basin Water Councils
C°	Degrees Centigrade
CEIA	Centre for Environmental Impact Assessment
DB	Drainage Board
DCM	Decision of the Council of Ministers
DLP	Defect Liability Period
DSDC	Department of Strategy of Donor Coordination
EA	Environmental Assessment
EC	European Commission
EIA	Environmental Impact Assessment
EFD	Environmental Framework Document
EI	Environmental Inspectorate
EMP	Environmental Management Plan
EMiP	Environmental Mitigation Plan
EMoP	Environmental Monitoring Plan
EPA	Environmental Protection Agency
ESFD	Environmental and Social Framework Document
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
EU	European Union
FIDIC	International Federation of Consulting Engineers
FS	Feasibility Study (Mott MacDonald)
GDWSS	General Directorate for Water Supply and Sewerage
GoA	Government of Albania
HPP	Hydropower Plant
I&D	Irrigation and Drainage
IFS	Institute for Food Safety
IPH	Institute for Public Health
IPM	Integrated Pesticide Management
IUCN	International Union for Conservation of Nature
IWRM	Integrated Water Resources Management
LGU	Local Government Unit
m/s^2	Metres per second squared
M&E	Monitoring and Evaluation
MARD	Ministry of Agriculture and Rural Development
MTE	Ministry of Tourism and Environment
MIS	Management Information System
MIE	Ministry of Infrastructure and Energy
NEAP	National Environmental Action Plan
NEC	National Environmental Council
NFA	National Food Agency
NGO	Non-Governmental Organization
NIVA	Norwegian Water Agency

ACRONYMS AND ABBREVIATIONS

NSDI	National Strategy for Development and Integration
NWC	National Water Council
O&M	Operation and Maintenance
OP	World Bank Operational Policy
%	percentage
PCP	Public Consultation Plan
PGA	Peak Ground Acceleration
PIM	Project Implementation Manual
PIU	Project Implementation Unit
PPP	Plant Protection Products
QTTB	Centre for Agricultural Technology Transfer
RAPs	Resettlement Action Plans
RBMP	River Basin Management Plans
RCC	Rehabilitation Construction Consultant
REA	Regional Environmental Agency
RPF	Resettlement Policy Framework
SEA	Strategic Environmental Assessment
SEC	Supervision Engineering Consultant
SIA	Social Impact Assessment
SIDA	Swedish International Development Agency
TA	Technical Assistance
TDS	Total Dissolved Solids
TOR	Terms of Reference
TS	Technical Secretariat of NWC
TSS	Total Suspended Solids
TWL	Top Water Level
USD	United States Dollar
UK	United Kingdom
WB	The World Bank
WFD	EU Water Framework Directive
WRC	World Soil Reference Base Classification
WRIP	Water Resources and Irrigation Project
WRMP	Water Resources Management Project
WUA/Os	Water User Association/Organization

1 EXECUTIVE SUMMARY

The main purpose of the Environmental and Social Framework Document (ESFD) is to ensure the dams, reservoirs and irrigation and drainage (I&D) schemes that are to be rehabilitated comply with the existing laws, regulations and customs in Albania as well as with the World Bank's Operation Policies and Safeguard Measures. Other aims of the ESFD will be to identify the most critical, overall environmental issues for the irrigation sector in Albania and to assist Government of Albania (GoA) in developing capacity for environmental impact assessment (EIA) within irrigation/agricultural sector projects; and finally to develop environmental guidelines for water and irrigation projects in Albania, through design and implementation to the monitoring and evaluation of results.

It is important to make clear that this ESFD covers all types of potential situations associated with rehabilitation of dam and I&D schemes and not all the mitigation measures may apply in all cases.

1.1 Legal and Institutional Framework

The main legal instruments in Albania have been developed in compliance with European Union (EU) standards; with the ultimate aim of EU accession. The National Strategy for Development and Integration (NSDI) is the main document for strategic development within Albania whilst the National Strategies for Agriculture and Food and similarly for Rural Development were developed to enhance synergies within related public institutions. Notwithstanding, the National Environmental Action Plan (NEAP) that was revised recently, stipulates that it is a constitutional right to live within an ecologically healthy environment and prioritised investment in watershed management, forestry and flood control. Recently Albania has introduced a new strategy for plant protection products (PPP). While the strategy is based on EU guidelines, it over-emphasizes concerns about safe trade, use, storage, transport and disposal of pesticides and related products, and fails to provide more comprehensive guidance for integrated pest management. In view of the recently produced EU Framework Directive for Sustainable Pesticide Use, Albania has indicated that it intends to prepare an integrated pest management (IPM) strategy that will be inspired and consistent with the guidance provided in the Framework in order to be aligned for EU accession.

The main laws concerning the Water Resources Irrigation Project (WRIP) are as follows:

- Law no. 111/2012 "On Integrated Water Resources Management",
- Law no. 24/2017 "On Administration of Irrigation and Drainage".
- Law no. 139/2015 "On Local Self-Government".

And the following Laws and By Laws:

- Decision of CoM Nr. 1108 dated 30.12.2015, "On Transferring of irrigation and drainage infrastructure, staff and assets from Drainage Boards to Municipalities".
- Decision of CoM No. 92, date 4.02.2015 "On some changes and additions to decision No. 945, dated 9.10.2013, of the Council of Ministers, "On the determination of the state responsibility campaign of the Ministry of Environment", amended.
- Decision of CoM No. 91, date 4.02.2015 "On some addition to decision no.939, dated 9.10.2013, of the Council of Ministers, "On determining the state liability area of the Ministry of Agriculture and Rural Development" (*Following DCM no. 91 and 92 dated 4.02.2015, the responsibility of the "Water Policy Directorate" was transferred from the Ministry of Environment, Forests and Water Administration (MEFWA) to the Ministry of Agriculture and Rural Development* MARD*) responsible for managing irrigation, drainage and flood protection)*
- Law on the Regulatory Framework in the Sector of Water Supply and Waste Water Administration

(No. 9915) and 2009 Ministerial Order No. 66, 2008

- Law on Environmental Protection (1993), amended in 2002 and 2008 including EIA
- Law on "Protection of transboundary Lakes", (No 9103 in 2003).
- Law On the Environmental Treatment of Wastewater (No. 9115 in 2003).
- Decision of the Council of Ministers (DCM) no. 177, dt 31.03.2005 "On the allowed norms of liquid discharges and the zone criteria for the receiving water
- Legal Framework on EIA Environmental impact assessment (EIA) was introduced in Albania in the Law on Environmental Protection (No. 7664 of January 21, 1993) and amended by Law No. 8364 of July 2, 1998.
- Law no. 8681, dated 2.11.2000 "On the design, construction, use and maintenance of dams and dumps.
- Law No. 7662 of 1993 (amended by Law 8529 in 1999, then amended by law 9362 in 2005 and finally supplemented by Law 9908 in 2008), on the Plant Protection Service provides for the organization of the Service and for parasite control, pesticides and plant quarantine. The Ministry of Agriculture and Food is responsible for the application of this Law.
- Law 9108 of 2003on chemical substances and preparations- This Law regulates the use and management of chemical substances and preparations with a view to protecting animal and human health as well as the environment. Producers and importers of chemical substances shall apply for registration, according to articles 9 and 10.

The National Water Council (NWC) is the primary authority responsible for water resources management in Albania, whilst the Ministry of Agriculture and Rural Development (MARD) is responsible for managing water resources, irrigation, drainage and flood protection. The NWC is supported by the Technical Secretariat of National Water Council (TSNWC), established by Decision of the Council of Ministers (DCM No. 230, dated 23.4.2014 on "Composition organization and functioning of TSNWC"). The Technical Secretariat of NWC implements water policy.
The Ministry of Tourism and Environment is responsible for environmental protection of forestry, fisheries and water quality control.

The General Directorate of Water Supply and Sewerage (GDWSS) of the Ministry of Infrastructure and Energy (MIE) is responsible for technical support to the water infrastructure, whilst municipal water utility responsibility was devolved to the local government with authority for administration, investment, maintenance, and regulation.
Authority over the river basins is quite complex.

Water management is organised at the Water Basins level through six Water Basin Councils (WBC), each of which having a Water Basin Agency (WBA). Each of the Water Basin Councils (WBC) is chaired by one of the responsible Prefects and is comprised of between 9 and 19 members representing ministries, LGUs, businesses and consumers in the basin (DCM no. 342 dated 4 May 2016 on the approval of the territorial and hydrographic boundaries of river basins in the Republic of Albania and composition of the council of each of them). The Water Basin Councils are assisted by Water Basin Agencies (WBAs), which function as a technical secretariat for the WBC Both the WBC and WBA are independent of each other. They are responsible for implementing the LWR. They perform the technical evaluation of applications for water abstraction (surface and groundwater), make recommendations for approval by the RBC, support municipalities in solving problems related to water resources and are responsible for on-site inspection of all activities related to water resources use.
The WBC approves licences which have been reviewed by the WBA.

Four Regional Directorate of Irrigation and Drainage (DIDs) funded by MARD are established under new law "On Administration of Irrigation and Drainage". While the municipalities are responsible for man-

agement of irrigation and drainage systems already transferred to them.
Water User Organizations (WUOs) are expected to be active in medium term, being responsible for operation and maintenance (O&M) of tertiary canals.

1.2 The ESIA process

The WRIP has been designated a Category B rating under the World Bank (WB) operational policy (OP) and safeguard requirements. Under the Albanian Law of Environmental Protection the project also needs authorisation from MTE before implementation can commence. Albanian and WB EIA procedures are generally aligned in this context and require three steps, namely; i) screening, ii) environmental assessment and iii) WB approval.

The following procedure needs to be followed: 13 site-specific ESMPs will be prepared by the MARD (one for every reservoir – Kurjan and Strum share the same reservoir). One public consultation will be held for each reservoir sub project. A number of sample site specific ESMPs have been prepared during project preparation.

The public consultation will occur when the ESMP is in a draft phase and the findings of the draft ESMP will be discussed. The views of the public will be incorporated in the final ESMP.
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MTE will need to approve the ESMP and once this is obtained, a relevant environmental permit issued.
The World Bank will review and provide no objection to the consultation result and Site Specific ESMPs.

1.3 The Project

The WRIP will comprise of the following components:

- Dam and Irrigation and Drainage Systems Rehabilitation
  a. Reservoir, I&D rehabilitation
  b. Pipeline Preparation
- Institutional Support for Irrigation and Drainage
  a. Institutional reforms of the I&D sector
  b. Support for Local Government Units (LGUs), WUOs
- Institutional Support for Integrated Water Resources Management
  a. Preparation of IWRM strategy
  b. Strengthening the institutional framework for IWRM
  c. Preparation of River Basin Management Plans
- Implementation Support
  a. Project Management
  b. Establishment of Monitoring and Evaluation system

The project requires the rehabilitation and revitalization of 13 agricultural reservoirs, some which are more than 50 years old, located throughout Albania in the northern part of Central Mountain Region, the southern Part of Central Mountain Region, within the Intermediary Zone of the Adriatic Pre Lowland Region, on the Intermediary Zone of the Hilly Central Region, and on the Intermediary zone between the Hilly Central Region and the Southern Mountain Region. The sites are located within the districts of Kukes, Korça, Berat, Fier, Lushnja and Saranda where agriculture remains the most important income and economic output.

The I&D schemes at the sites are in very poor shape with only 44% of the intended irrigated area operational, all reliant upon gravity systems, the pumped systems have broken down many years ago.
Essentially all dams and I&D schemes require some rehabilitation work; some more than others; one dam

needs to be rebuilt; some have bad siltation; and some have some stability issues. A geotechnical survey is planned to be undertaken at all 14 sites during the detailed design stage. The I&D schemes vary in their state of repair, some are generally still functional but others are completely broken. The options for rehabilitation in this case are using gravity in most cases as this is the least cost option for sustainable development.

The full extent of the rehabilitation works will not be known until after the detailed design. However, an important point is that the intended rehabilitation of the dams and I&D schemes are all taking place within the existing footprint of already established reservoirs and irrigated areas and no new land areas will be taken as a result of the development. The rehabilitation works are also not near to, nor will they affect, any protected areas as they are located a long distance from them. The sites for the rehabilitation are also already heavily modified by past human interventions. Notwithstanding, four of the dam sites are intended to have their crest raised by between 0.3 and 0.5 metres with a rise in top water level (TWL) and this may impact on some shorelines and land surrounding the specific reservoirs, but in all cases this land is the property of the state. Specific details of the extent of the flooded area at the raised TWL are not known at this stage, but will become apparent during the detailed design.

1.4 Baseline

The Climate is generally Mediterranean and characterised by four seasons and influenced by environmental characteristics such as geographical position, geomorphology, hydrology etc. Snow and ice are common in the mountains in winter and the majority of the rain falls between Oct and April. June and July are normally the hottest months. Winds are influenced by the geomorphology and the Adriatic Sea. The ambient air conditions at the reservoir sites are generally good under natural circumstances as they are quite far away from the cities or industrial areas.

The geology of the sites varies, but the most abundant rocks are magmatic (igneous) effusive sedimentary and calcareous formations, which have been effected by a number of mountain building periods that continue to this day. This is evident from the seismic conditions of the area where some of the sites lie within quite seismically active zones. The detailed design for the rehabilitation works will analyse the seismic effects on the reservoir sites.

Soils are varying widely throughout the sites and are heavily dependent upon the underlying geology, flora and vegetation types, climate and exposure, water presence and effects etc. In the more elevated areas, the soils are prone to heavy erosion. According to the World Soil Reference Base Classification regosols, leptosols, cambisol, luvisols, and vertisols are present at the sites.

The sites lie within two basins; the Drini River (covering the sites in Tropoja and Kukes) and the Seman River which covers the remaining sites. The Seman has two main tributaries; the Devolli and the Osum rivers. The Drini is the longest river in Albania and combined with the Buna discharges about 21.4Mm^3/yr of water to the sea. The Devolli River is the largest branch of the Seman River; accounting for 88% of the discharge water.

The Albanian rivers are characterized by being highly erosive and with high turbidity. Notwithstanding, the Drini River does not suffer from siltation problems as much as other areas. Karstic waters are also common and influence the water quality particularly in the Seman River. Anthropogenic activity has also negatively influenced the water quality and this is made worse by the lack of wastewater treatment. The northern sites are not as badly affected by this. The quality of the irrigation water is also a cause for concern at Murriz Thana in the dry season where high salinity is recorded and this can have a damaging effect on crops. There is also potential for oil contamination near to the Zharrez reservoir site due to the surrounding oil extraction industry, but clean up and containment has been undertaken recently due to numerous “hotspot” clearance projects. The Seman Basin flows to the sea near to the Karavasta Lagoon and it is important that irrigation return water from reservoirs in the Fier District do not influence the wa-

ter quality flowing into this protected area. Besides this site, none of the other protected sites in Albania (15% of the whole of Albania has protected status) appear to be affected by the rehabilitation works on the project.

The natural vegetated areas surrounding the study sites exhibit "bush" vegetation, comprised by evergreen makia. In the hills, below 800masl, this vegetation is substituted by plantations, mostly olives or fruit trees. With increasing altitude the main vegetation changes to oak (*Quercus)*, beech (*Fagus Sylvatica*), as well as hop hornbeam (*Ostria Carpinifolia)* and oriental hornbeam (*Carpinus Orientalis*). At the altitude of 1,000masl and above woodlands of ash (*Fraxinus*) and pine (*Pinus*) appear. None of the dam and reservoir sites are near to denominated national parks, national monuments or other protected sites of special interest.

The fauna of the sites under the study is typical to Balkan and European elements. The areas surrounding the sites are not very rich in wildlife primarily due to the close proximity of human settlements that have existed in the area for a long time. In the more remote forest areas wolves, bears, wild cats and other mammals occur and have a protected status. Around the reservoir sites and their surroundings many different kind of raptors, reptiles and amphibians can be seen. The lake/reservoir waters have some fish species introduced such as carp (*Cyprinidae*) etc. Within the upper streams of the study areas indigenous fish species (i.e. Greyling (*Salmos Thymallus)*) are observed. The reservoir sites are situated within areas which have been predominantly adapted for agricultural production. From the surveys undertaken at the time of the site visits to the 14 dam sites and the 13 associated I&D schemes no flora or fauna was identified within these project areas that could be considered to be at risk or threatened.

There are more people living within the rural areas than in urban centres. This can be interpreted by the importance of agriculture development and irrigation needs in such regions. The areas have seen migration away from the districts in the past 20 years, but this has now changed due to Albania obtaining the right for free movement within EU countries, In the past two years the economic crisis in Europe has implied that more Albanians have now returned home and represent a valuable labour resource for rural development. Family sizes at the reservoir sites average between 5-6 people, the most populated districts are Fier and then Lushnje, Berat, Korça etc. Farm sizes have decreased substantially from the days of the cooperative farms and now average 1.2ha/farm.

Unemployment is quite high in the districts under review, but this is primarily in the urban centres. In the rural areas, many of the people are self-employed on their own farms and are dependent upon an income from marketing their produce. Health and social insurance is very low in these rural areas, with only a few people from villages working in the state sector that qualify for health and social insurance.

Albanian is spoken throughout the project areas. Islam is the main religion, although the sites in Korça district also have a high number of Orthodox, due to their proximity to Greece. Education follows similar patterns to the rest of Albania, with better facilities in the towns of Fier and Korça. A similar pattern emerges for health services with Kukes being the worst off, due to the districts remoteness.

Land use is related to land tenure, the state owns the protected areas, reservoirs, rivers etc. but this land can be offered with a concession to private developers. In general, agricultural production is expected to increase over the next few years, with more demand for fertilisers and pesticides, but with crop production and tonnages increasing. However, there are factors that will hinder this development, such as the excessively low income levels and continued poverty of the rural population that will reduce in part the use of fertilizers and pesticides because they are not affordable by the majority. This on the one hand is good for the environment as it helps prevent excessive water pollution, but on the other hand, crop production quality and quantity is reduced. Nonetheless, there will be need for strengthening of capacity to the MAFCP outreach services to promote IPM approaches and training in the project areas. Training will include risks, hazards and safe practices for handling, storing, using and disposal of pesticides but also

sustainable pest management based on an IPM approach. Provisions for this training will be described in the site specific ESMPs for the I&D schemes.

The poor state of irrigation reservoirs and canals is also influencing a reduction of agricultural products. Furthermore, problems of climatic change and malfunction of draining channels has created problems with flooding during extreme rainfall events.

Within the areas of the irrigation schemes and reservoirs, the most popular crops are forages and alfalfa or lucerne, with wheat grown in winter and spring, and maize grown in the summer. Small lands or gardens are planted with vegetables. Beans and hay are grown also in Kukes district. There are a lot of fruit tree plantations in Korça, Fier and Lushnje and Berat. In the southern areas, livestock dominates, with dairy cows accounting for around 90% of the bovine structure

1.5 Environmental Impacts

Positive environmental impacts from the project are mainly long terms and are:

- Improved flood control
- Increases in intensive green cover from irrigation
- Reduction in erosion activity
- Improvements to human health
- Improvements to the wildlife environment

Negative environmental impacts tend to mainly occur during the construction phase and are summarised as follows:

- Reduced irrigation capacity during rehabilitation works
- Disposal of building/excavation materials
- Human disturbance during construction from noise, dust, visual, etc
- Illegal exploitation of materials (sand and gravel from rivers) or forestry
- Accidents to workers or nearby residents
- Uncontrolled generation of solid waste and sanitary waste
- Decrease in reservoir depth due to siltation
- Reduction in reservoir volume affects fish during the construction works
- Inappropriate quality of irrigation waters
- Accidental overflows
- Danger of water logging and soil salinization

Positive social impacts are as follows:

- Improvement to local incomes through employment in short term and long term
- Improvement to local and national economy
- Financial and educational improvements with an improvement in land value
- Social and cultural improvements with a more stable population
- Potential for small scale hydropower at selected sites
- Improvements in crop yields

Negative social impacts are as follows:

- Reduction in reservoir capacity during the construction limits agricultural production that could lead to unemployment and financial stress

- Conflicts between stakeholders on use of reservoir water (i.e. fisheries, irrigation or hydropower)
- Create differences/jealousy between owners of land under irrigation and those without.
- Poor quality of irrigation waters can reduce or destroy crop yields.
- Danger to public safety with irrigation canals and pesticide residue
- Disruption to farming practices during construction

1.6 Alternatives

The following alternatives were reviewed;

- The zero option
- The delayed project option
- Alternative Site relocation option.

Besides the alternatives referred to above alternative sources of water and demand reduction through conservation and re-use and water management and monitoring were considered but were found to be unrealistic and to have similar impacts to the current project under consideration.

None of the above options would be suitable; the 14 dams already exist, the 13 reservoirs are already in existence and have been periodically filled and emptied over a number of years. The I&D schemes are already in existence and there is no change to their existing footprint. The intended rehabilitation works on the dams for safety and on the I&D schemes will improve the reliability and efficiency of this irrigation resource.

1.7 Environmental and Social Management Plan

Site specific Environmental and Social Management Plans (ESMPs) will be prepared for each of the project sites as a separate document. Site specific ESMPs will be divided into two parts; the first for the dam safety rehabilitation works; and the second for the I&D schemes rehabilitation works. This is because the construction contract for the dam safety rehabilitation is likely to commence in the first year of WRIP and the I&D scheme rehabilitation is likely to commence in the second year. It is the intention that the site specific ESMPs are used as much as possible in the tender document, hence the need to separate the dam safety rehabilitation issues from the I&D issues. Each site specific ESMP in every case will comprise two separate sections: a Mitigation Plan (EMiP) and a Monitoring Plan (EMoP). During project preparation, a number of sample site specific ESMPs have been prepared.

Strengthening of the institutional framework can help the facilitation of the ESMP. This can include issues such as improvements on legal and institutional management of I&D systems. Some suggestions for the improvement of the legislation framework might be:

- Define the role, competencies and responsibilities of local government units (municipalities) in I&D management as a way to improve sector performance. This role may involve:
  - The transfer of right to use a substantial portion of infrastructure (small and medium reservoirs, second and third channels of irrigation and drainage etc.) and transfer of responsibility for operation and maintenance of net transfer of infrastructure;
  - Promoting the establishment of WUO, by being an integral part of their management structures and support for strengthening and functioning of the WUO
  - Fixing the irrigation service fees / drainage and collection aiming at a gradual coverage of the costs.
  - Updating the laws on pesticide use and on raising awareness and promotion of integrated pesticide management (IPM) by increasing monitoring provision
- Mobilizing financial resources from other units of local government itself or securing grants from the state budget based on needs.

It is anticipated that monitoring will be conducted during all phases of the project: namely design (pre-construction), construction, operation and maintenance. The EMoP will play a pivotal role in ensuring that the trends for specific parameters are tracked and it will provide information on compliance with legislative norms, set guidelines or desirable operational limits; and form the basis for corrective actions and modification of activities if necessary. The intensity of sampling will depend on the time and location of the development activities and results derived from monitoring data.

The EMoP will take into consideration the scope of development, environmental and social sensitivity and the financial and technical means available. The EMoP will identify and describe the indicators to be used, the frequency of monitoring and the standard (baseline) against which the indicators will be measured for compliance with the ESMP.

1.8 Timing and ESMP Costs

MARD should reassign an Environmental Engineer under the capacity building component of the WRIP to oversee the dam safety and I&D schemes rehabilitation project. Alternatively the supervision of the rehabilitation could be outsourced to a suitable experienced environmental consultant. According to the Feasibility Study, the dam safety rehabilitation works for the individual sub projects will last between 2 months (for Staravecke) to 12 months (for Murriz Thana). The total combined costs for the dam rehabilitation and I&D works have been estimated at USD 37.3 million. The cost for the dam safety rehabilitation only is USD 10.5 million. The costs of the ESMP component, the majority of which are contained in the above dam safety rehabilitation construction costs are estimated at about USD 1.6 million over a three year period

1.9 Public Consultation

The implementation of the WRIP overall depends on the meaningful participation of all stakeholders for success. Consequently the public consultation process has commenced. Meetings have been organised between the decision makers and the other stakeholders in each of the districts that contained the reservoir sites. Invitees included farmers, Drainage Board / Irrigation and Drainage Directorate staff, commune/municipality heads and representatives of the communes/municipalities, experts on reservoir operation, agricultural experts. A social and environmental expert from the Consultant also attended the meetings. Questionnaires were prepared and completed.

In general the meetings were conducted in a cordial manner and were very informative. Issues that arose were on matters regarding the water quality of the water, this particularly concerned Murriz Thana reservoir.

At least two other reservoirs are used or intended for use as small scale hydropower production. Belesova reservoir has a small hydropower facility and one is intended for Murriz Thana

Other points that were raised were on the siltation, as many of the sites were prone to high rates of sedimentation which is seriously reducing the reservoir capacity.

In most of the sites drinking water is obtained from wells or other natural water sources, and it is of satisfactory quality. Sewage is discharged into tanks (not septic) but small amounts are flushed into the reservoirs (e.g. Belesova reservoir) during heavy rainfall. New buildings (house and restaurants) are being built close to the reservoirs and there is some concern on pollution to the irrigation water.

However, in general all the participants were positive and interested at the immediate project implementation despite the above environmental concerns and fully agreed with the proposed mitigation and monitoring processes.

Upon completion of a draft ESFD, public disclosure meetings were held in Lushnja and Kukes, located in the centre of the project sites in the two river basins, on September 14, 2012. Documents that were disclosed include the ESFD, RPF and sample site-specific ESMPs. Minutes of these meetings are presented in annex C. A third meeting will be held in Korca. Disclosure was initiated on 25th July 2012, when public consultations were announced by posting notices in the regional Drainage Board and local offices of the involved Municipalities. This notice informed the public that the documents mentioned above were available to view in the board and commune offices, and invited interested stakeholders to provide comments and ask questions.

A public announcement on the local television station TV7 (seven) was made on 13th September 2012 inviting the public, authorities and relevant institutions to a meeting to have an insight into ESFD, RPF and Site Specific ESMPs for the proposed dam safety rehabilitation and irrigation and drainage schemes to be undertaken by the Project. Since local TV stations were judged to be the most effective way of communicating with stakeholders to ensure broad coverage, messages were announced on local TV stations on September 13. The public disclosure meeting followed earlier consultation meetings held during preparation of the safeguards documents.

Prior to announcement on the television the printed version of the ESFD, RPF and sample Site Specific ESMPs have been made publicly available on site, and also placed on MAFCP web site http://www.bujqesia.gov.al//projekte/projekti i burimeve ujore (http://www.bujqesia.gov.al/al/projekte/kadastra-kombetare-e-burimeve-ujore). This documentation still remains on view.

A printed version of the Draft GESMP, ESFD, RPF and Site Specific ESMPs was also available for examination in the premises of MARD Project Office Tirana, on working days (Monday to Friday) between the hours of 8.30 a.m. to 3.30 p.m.

The meetings were held on 14 September 2012 at 11:00 a.m. in the Meeting Room of the offices of the Technology Transfer Centre (QTTB) in Lushnja and the Drainage Board in Kukes. In Lushnja, 30 people attended the meeting. In Kukes, 19 people attended. The composition of the attendees was 9 and 19 farmers, and 9 and 6 staff members of the Drainage Board in Kukes and Lushnja, respectively.

2 INTRODUCTION

2.1 Preamble

This document presents the Environment and Social Framework Document (ESFD) for the Water Resources and Irrigation Project (WRIP) involving rehabilitation of existing dams for enhanced safety and irrigation and drainage (I&D) systems. Dam safety rehabilitation works are planned to be conducted in the first year of the WRIP project. Investments in the rehabilitation of the irrigation systems that are associated with the dams will be done during year two of the WRIP project. A total of 14 dams and 13 reservoirs (2 dams share the same reservoir) and the immediate ancillary works around the reservoirs systems are planned to be rehabilitated in the first year. Generic instructions for the preparation of site specific ESMPs for the dam safety rehabilitation part and the I&D systems rehabilitation works (canals, pipes etc) are contained in section 10 of this ESFD. The overall feasibility and preliminary design for dam safety and the I&D systems rehabilitation are being undertaken by Consultants, Mott MacDonald from the UK. It is important to stipulate that the rehabilitation works are to be undertaken within the existing footprint of the 14 dam and 13 associated I&D schemes and hence it is not foreseen that any private land will be taken for development.

The main purpose of the ESFD is to be a tool for ensuring that the infrastructure sub-projects (i.e. the dams and reservoirs that are to be rehabilitated under Year1 implemented through the WRIP comply with the existing laws, regulations and customs in Albania as well as with the World Bank's Operation Policies and Safeguard Measures and will not have a lasting adverse impact on the country's population, the natural environment or assets of particular cultural value. A summary of the possible environmental and social issues and mitigation measures is presented in the chapters that follow. Cost estimates for implementation of safeguards measures for infrastructure investments supported by the Project will also be included in the site specific ESMPs that are under preparation.

The overarching goal of the ESFD is to improve decision making and to ensure that the dam and irrigation improvement options that are being considered are environmentally sound and sustainable. Another main objective of the ESFD is to ensure that in-country capacity, regulatory framework; principles and procedures are established and will serve as the base for environmental assessments of all future individual irrigation rehabilitation projects being carried out under the WRIP. More specifically, the purpose of the ESFD will be to:

- Identify 'the most critical, overall environmental issues for the irrigation sector in Albania;
- Assist the Government of Albania in developing in-country capacity for environmental impact assessment of irrigation/agricultural sector projects by developing the policy/regulatory and institutional framework for EIA, as well as strengthening the EIA capacity in all institutions, involved, i.e. in governmental road sector and environmental agencies and among national contractors,
- Define environmental principles for dam rehabilitation development under the WRIP;
- Develop environmental guidelines for water and irrigation projects in Albania, covering environmental considerations in all stages of a project from identification and selection of rehabilitation works, through design and implementation to the monitoring and evaluation of results.

2.2 Layout and Structure of this Report

The structure of the ESFD closely follows the format shown in the terms of reference (TOR) for the Environmental and Social Impact Assessment, Resettlement Policy and Baseline Surveys. In that regard the following report structure has been provided:

- Chapter 1 - Executive Summary
- Chapter 2 – Introduction
- Chapter 3- Policy, Legal and Administrative Framework
- Chapter 4- National and WB Procedures /Regulations Required for ESIA
- Chapter 5- Project Description and Objectives
- Chapter 6- Baseline Data
- Chapter 7 - Environmental Impacts
- Chapter 8 - Social Impacts
- Chapter 9 - Analysis of Alternatives
- Chapter 10 - Environmental and Social Management Plan split into two sections i) covering dam safety rehabilitation and ii) I&D rehabilitation includes:
    - A: Mitigation Plan
    - B: Monitoring Plan
- Chapter 11 - Public Consultation – Summary of Inter-agency and Public Consultation Meetings
- Appendices (any reference and supporting information deemed necessary

3 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

3.1 Policy and Legal Framework

In Albania, many legal instruments regulate activities related to environment, agriculture, land use, land protection, forestry etc. These laws have been generally developed in compliance with European standards and requirements, since Albania is working towards EU accession.

The National Strategy for Development and Integration 2007-2013 (NSDI) represents the fundamental strategic document of the country that harmonizes for the first time the perspective of the sustainable economic and social development, integration into the European Union and NATO structures, as well as the achievement of Millennium Development Goals. The NSDI was finalised in December 2007 and approved by DCM no. 342 date on 12 March 2008.

The NSDI crystallises the medium- to long-term vision of the development of Albania based upon an open and transparent process, which guarantees the broad inclusion of the civil society, local government, the business community, the academic and scientific world, the Albanian political spectrum and other groups of interest. Implementation of NSDI envisages the building of policy analysis capacity to ensure that the goals/objectives of NSDI are effectively translated into concrete policies and programs at the ministry level.

The National Strategy on Agriculture and Food and the National Strategy Plan for Rural Development, also covering the period 2007-2013, were developed to provide the framework for integrated rural development programs and are designed to enhance synergies among all related public institutions. Poverty reduction and sustainable management of natural resources (including land, water, and biodiversity) are among the objectives. Another relevant key strategic document is the **National Environmental Action Plan (NEAP),** that was prepared in 1994 and revised in 2001 with the ultimate goal of meeting the constitutional right to live in an ecologically healthy environment. The plan identified several priority investment programs, including watershed management, forestry, and flood control

The both above National Strategies were revised and new Strategies were adopted by Albanian Government for the period 2014-2020, which intend EU integration of the country.

A new Plant Protection Product Strategy (PPP) has been introduced into Albania in 2012 in order to comply with EU requirements for accession. To comply, Albania is required to complete a detailed questionnaire sent by the EU. Part of this questionnaire deals with Plant Health and PPP, including pesticides (point 54). In order to address this issue and respect the EU legislation a new decision of the council of ministers (DCM) was prepared that considers separately the trade, disposal and transport of pesticides and other chemicals and a separate Guide of the Council of Ministers (GCM) will be prepared separately for pesticide use criteria – no legal act has yet been drafted on pesticide use. Point 54 of Albania Questionnaire for EU candidature which responds to PPP is contained in Annex A1.

While the PPP strategy provides a comprehensive framework for addressing trade, use, storage and disposal of pesticides, the strategy falls short in addressing pesticides in a more comprehensive way through a strategy on integrated pest management (IPM). In this respect, the EU recently adopted a Framework Directive 128/2009 on the sustainable use of pesticides. The Government of Albania (GOA) has indicated that it intends to follow this directive, and that a strategy for IPM will be prepared soon. The strategy to be adopted by GOA will be consistent with the EU Directive to achieve more sustainable use of pesticides and will include:

- reducing the risks and impacts of pesticide use on human health and the environment

- promoting the use of IPM and of alternative approaches such as non-chemical alternatives
- establishing National Action Plans (NAPs) with targets, measures and timetables to reduce risks and use of certain products
- provide for access to training for professional users, farmers, distributors, advisors
- awareness raising for the general public
- regular inspection of application equipment in professional use
- prohibition of aerial spraying
- protection of the aquatic environment and drinking water (buffer zones, low-drift equipment, reduction of use when risks of run-off)
- prohibition or minimisation of pesticide use in specific areas
- safe handling, storage and waste of pesticides
- calculation of risk indicators to monitor progress
- promotion of low pesticide input farming and IPM

Full support for the preparation of the strategy and comprehensive support for its implementation is beyond the scope of WRIP. However, WRIP will support IPM by including a session on IPM approaches in its farmers/WUAs training program. Issues that will be covered in this training include IPM strategies and techniques, integrated crop management strategies and techniques, organic farming principles, biological pest control methods, information on the general principles and crop or sector-specific guidelines for IPM, alternative crop husbandry measures to prevent and/or suppress harmful organisms by: crop rotation, use of adequate cultivation techniques (e.g. sowing dates and densities, under-sowing, conservation (zero) tillage, pruning and direct sowing), use, where appropriate, of resistant/tolerant cultivars and standard/certified seed and planting material, use of balanced fertilisation, liming and irrigation/drainage practices, preventing the spreading of harmful organisms by hygiene measures (e.g. by regular cleansing of machinery and equipment) and protection and enhancement of important beneficial organisms, e.g. by adequate plant protection measures or the utilisation of ecological infrastructures inside and outside production sites. The training program will be elaborated during preparation of the site specific ESMPs.

3.1.1 Principal Legislation

Albania's 1996 Law on Water Resources (No. 8093) (Water Law) comprising the Law No.8093, dated 21.3.1996 "On Water Resources" improved, updated and adapted with the Law No. 8375, date 15.07.1998, Law No.8605, date 20.04.2000, Law No.8736, date 01.02.2001, Law No. 9837, date 03.12.2007, Law No.10 137, date 11.5.2009 is the primary legislation governing the country's inland, maritime, surface, and groundwater and is intended to ensure the protection, development, and sustainable use of the country's water and provide for its proper distribution. The Water Law addresses water rights, water use, and governance of water resources. A new law on water management has been drafted and was being circulated internally for review in 2010. The Law no. 111/2012 "On Integrated Water Resources Management" was adopted by Albanian Parliament in 2012.

The '1999 Law on Irrigation and Drainage (No. 8518) comprising the Law No 8518, date 30.07.1999 "On Irrigation and Draining" improved, updated and adapted with the Law No 9860, date 21.1.2008 "On Some Changes and Additions in the Law No 8518, date 30.07.1999 "On Irrigation and Draining" established the structure for Water User Associations (WUAs) and Water User Organisations (WUO which are private groups that manage water irrigation infrastructure at and below the secondary canal level. Federations of WUAs manage the primary canal networks. The government maintains ownership of the infrastructure.
The Law no. 24, "On Administration of Irrigation and Drainage", adopted in 2017 gave to the municipalities a key role for irrigation and drainage management.

The Law on Organization and Functioning of Local Government (No. 8652) (2000) transferred responsibility of water supply and management of water utilities to local government (communes and mu-

nicipalities).
By the Law no. 139/2015 "On Local Self-Governement" and Law no. 24/2017 "On Administration of Irrigation and Drainage" the irrigation and drainage service is one of the key functions of the municipalities

The 2008 Law on the Regulatory Framework in the Sector of Water Supply and Waste Water Administration (No. 9915) and 2009 Ministerial Order No. 66 provides authority for the establishment of an inter-ministerial working group for the evaluation of projects and issues related to drinking water supply and sewage sector in Albania. The working group is led by the MIE.

The Law on Environmental Protection No. 8934, (1993), amended in 2002 and 2008) forms the basis for environmental management in Albania. The law addresses the prevention and reduction of pollution, sustainable management of natural resources, monitoring, how to define pollution levels. It provides binding provisions for EIA and the implementation of the polluter pays principle. The law provides the institutional framework for environment.

The MEis the highest governmental body responsible for environmental protection. Beginning in early 2006, the ME was additionally tasked with overseeing most issues related to water, pasture, and forest management. The ME may propose measures for the protection and preservation of the environment, forestry and water resources and is responsible for the implementation of water policy and forestry policy. To support of the activity of ME the following are established and operate:

- The National Environmental Council (NEC), and
- The Councils on sector environmental policies, which are composed of persons in the environmental field, representatives of research and education institutions, ministries, other central institutions, members of NGOs etc.

The composition, the duties and the function, of the NEC, as well as the expenses for its establishment and functioning are approved by the Council of Ministers upon the proposal of ME. To realize and enforce legislation for environmental protection at the local level, the Regional Environmental Agencies (REAs) are in charge, which are specialized bodies in environmental protection, dependant upon the ME.

The Environmental Inspectorate (EI) functions within the ME as a specialized body on environmental control. The inspectors exercise their control activity in all the territory of the Republic of Albania, while the inspectors of the REAs operate within the prefecture's territory.

Protecting and maintaining the natural water resources, and their rational and fruitful administration, is one of the main aims of the Law on Environmental Protection. Water protection intends to ensure the prevention of the further destruction of the surface water quality and exceeding respective quality norms, recovering of contaminated surface water quality, and achievement of the water quality objectives, improvement of the balance of extraction levels and natural regeneration of groundwater, protection of water, flora and fauna.

The Law on "The protection of transboundary Lakes", No 9103, date 10.07.2003, consider protection and monitoring of transboundary lakes and their basins. The law is focused mostly at three main Lakes; of Shkodra, Prespa and Ohrid. The law aims at the environmental protection of the transboundary lakes in their natural state, guaranteeing the appropriate conditions for the development of life and ecosystems in these lakes, through the promotion of useful activities in compliance with the requirements of the sustainable development principle and stopping of activities that threaten them. Further to this aim, unique ecosystems, with international value, such as the above mentioned transboundary lakes, are specially protected by the state, and have been proclaimed as protected areas, according to laws no. 8906, dated 06.06.2002, on "Protected areas" and no. 8093, dated 21.03.1996 on "Water reserves", as well as through international conventions ratified by Albania. (Now, all of them are proclaimed by the Decisions of

Councils of Ministers as protected areas, while Skadar Lake is proclaimed as a Ramsar site). The scientific research activities in transboundary lakes are implemented with the approval of the REAs or by MEFWA.

Law No. 9115, dt 24.7.2003 "On the Environmental Treatment of Wastewater" is aimed at protecting the environment and the health of people from the negative impacts of wastewater, defining the rules for their environmental treatment and the obligations of wastewater discharge. The objects of this Law are the urban and industrial wastewaters, according to the special branches of the industry, waters from the irrigation of the agricultural lands and sewerage of any kind.

Decision of the Council of Ministers (DCM) no. 177, dt 31.03.2005 "On liquid discharges and the criteria for the receiving waters"contains the approved standards for various industries and the quality of urban water following treatment, based on the respective instructions of the EU. This act sets the criteria for classification of the receptive water bodies, aiming at the compilation of the list of sensitive and less sensitive areas, which are reviewed every 4 years. The law requests the active participation of the BWCs and BWAs for the prevention and clean up of the water basins under their jurisdiction.

Legal Framework on EIA Environmental impact assessment (EIA) was introduced in Albania in the Law on Environmental Protection (No. 7664 of January 21, 1993) and amended by Law No. 8364 of July 2, 1998. The law defines basic provisions and empowers the MEFWA to specify those activities that will be subject to assessment. The shift in 1990 towards democracy, changes in the political structure and the free movement of population have had a great impact on the country's socio-economic structure. As a result of the changes during this period, an increased number of parallel activities and development projects in several fields have been initiated, many of which could have considerable environmental impact. Taking this situation into consideration, the ME identified the establishment of effective EIA and strategic environmental assessment (SEA) systems as a priority. Not only will these systems assist in meeting new challenges of country development, but they will also help to mitigate any possibly negative impacts of new projects, policies, plans and programmes. Bearing this is mind, the Law on Environmental Protection was reformulated and approved by the Albanian Parliament and entered into force in October 2002. This new law contains a special chapter on EIA, and a more specific EIA law has been approved in 2003.

Law No. 7662, of 1993 (amended by Law No 8529 in 1999 and further amended by law 9362 in 2005 and supplemented by law 9008 in 2008), on the Plant Protection Service is in accordance with EU regulation 91/414/EEC and deals with quality control of all imported pesticides and their registration procedure by a State Commission which includes ME membership. The law provides for the organization of the Plant Protection Service and for parasite control, pesticides and plant quarantine. MARD is responsible for the application of this Law.

In 1993 the State Pesticide Commission, was established with a mandate from the DCM No. 548, dated 6 December 1993, which regulated pesticides used in agriculture. Following review by scientific institutions and the State Pesticide Commission on pesticide effectiveness, impact on human health, animals and the environment, and possible secondary effects, pesticide registration was established that requires a permit for the import and use of pesticides in Albania. The State Pesticide Commission was renamed the State Commission on Registration of Products for Plant Protection under Law no 8529 in 1999. To date (September 2012), approximately 254 pesticides have been acceptable and licenced for use in Albania whilst some 103 are not permitted to be imported but only can be marketed and used (this covers for the existing stock in Albania) . Annex A2 provides a full list of pesticides permitted and not permitted for import in Albania. The classification of pesticides, according to toxicity, is based on WHO guidelines which are in line with the requirements of the WB OP 4.09.

Law 9108 of 2003 on chemical substances and preparations regulates the use and management of

chemical substances and preparations with a view to protecting animal and human health as well as the environment. Producers and importers of chemical substances shall apply for registration, according to articles 9 and 10. The Law consists of the following Chapters: (I) General provisions; (II) Classification of chemical substances and preparations; (III) Registration of substances; (IV) Management of hazardous substances and preparations; (5) Introduction into the market of hazardous substances and preparations; (6) Authorization for management of hazardous substances and preparations; (7) Import and export of hazardous substances and preparations; (8) Registration and notification of hazardous substances; (9) Administrative contraventions and fines; (10) Transitory and final provisions. Appendix No. 2 of the law contains the list of substances which may not be produced, imported, exported or distributed. Medical products, feeding stuffs, cosmetics, plant protection products and substances that deplete the ozone layer are excluded.

3.2 Regulations and other provisions concerning EIA in Albania

The EIA procedure is explained in the EIA Law (No. 8990 of January 23, 2003), while the main concepts and interested actors in the process are defined in the Law on Environmental Protection (No. 8934 of September 5, 2002), Chapter IV. Chapter IV on EIA and SEA, of the Law on Environmental Protection contains eight articles regarding EIA and SEA. The section on EIA states that the EIA process is the responsibility of the developer. Public participation and local government each play principal roles in the process. This chapter's articles pave the way for the EIA Law that regulates the administrative part of the process. It also grants rights to objections and court appeals against final decisions of ME on proposed projects and EIA procedures. The law presents a concept of approval from the ME , namely:

- an environmental statement (declaration) issued by the MTE;
- an environmental authorisation issued by the MTE/regional environmental authority (REA); and
- an agreement issued by an REA.

The issues of environmental authorisation and agreement are regulated within the law, while government decisions are detailed in a separate article. Regarding construction permits, the MEFWA does not issue environmental authorisations, but instead issues a declaration by which it agrees to or refuses a request, accompanied by any additional comments. The new EIA Law also: determines the lists of projects which require a full or partial EIA, and also lists the criteria by which projects are selected (Appendices 1 and 2 in the EIA Law);

- specifies the contents of full and partial EIA reports;
- provides a timetable for the process;
- describes a developer's rights and duties, provisions for public participation; including descriptions of roles of non-governmental and governmental organisations; and determines the position of REAs within the process.
- The law also introduces and implements the SEA process through the same procedure as that of Appendix 1 projects that require a full EIA.

3.2.1 Major Players in the EIA Process

Major players in the EIA process in Albania are detailed as follows:

- environmental authorities and representatives at the local and regional levels responsible for setting up policies, legislation, permits, compliance and enforcements (MTE is the central body in the environmental field, along with its REAs, who are dependent upon it). MTE operates in close collaboration with several other ministries and institutions on specific EIA-related issues, such as the MARD, Ministry of Health and Social Protection, MHSP, Ministry of Infrastructure and Energy, as well as councils of communes, municipalities or districts and the relevant administrative units that, according to the Law on Environment Protection, inherit their rights and duties regarding environmental protec-

tion issues at national, communal and municipal levels.);
- developers and investors responsible for preparing proper applications, implementation of permitting conditions and self-monitoring of standards, etc.;
- consultants and experts that prepare EIA reports;
- Scientific and research institutions that conduct studies in the environmental field (Academy of Science, Research Institute of Chemical Studies, Institute of Biological Research, etc.); and
- NGOs that plays an important role in raising awareness, conservation and protection of natural and cultural values, etc.

The Inspectorate for Environmental Protection has 43 employees, including REA inspectors. The chief inspector for environmental protection and three other employees are based at MEFWA. Duties include guiding developers in preparing EIA reports, receiving EIA reports and other required documentation, reviewing EIA reports, inspection of areas proposed for development, and preparation of MEFWA opinions are the responsibility of regional environmental agencies, according to the new EIA Law.

All applications for environmental permits need to be processed through REAs. Subsequently, the necessary documentation is sent to the ME's EIA Directorate and the Inspectorate for Environmental Protection, where an application is reviewed and a draft permit is prepared. The draft permit is discussed with technical directorates and legal bodies to finalise conditions put forth in the draft permit. The Permitting Commission then discusses the documentation. If the application for an environmental permit is rejected, the developer receives official notice of this decision.

3.2.2 The EIA Process

According to the Law on Environmental Protection and the EIA Law, four types of environmental consent can be issued:

- Environmental declaration;
- Environmental permit;
- Approval; and
- Authorisation.

ME and its agencies (REAs) determine whether a development project requires an EIA. Chapter III-Article 6 of the EIA Law states that the REA responsible for the region where a project will be implemented is responsible for determining whether or not the project requires an EIA. The Law on EIA includes a list of projects that is fully in compliance with Annex I of the EC Directive. There are two lists of projects determined for an EIA:

- those projects which require a full EIA; and
- those projects which require a partial EIA.

The REA reviews an EIA reports first. It examines the lists of activities to reach a decision as to whether a full or partial EIA is needed.

3.2.3 Strategic Environmental Assessment

Article 5 of the draft EIA Law determines that SEAs are required for: strategies and action plans for energy, mines, transport, agriculture, forests, administration of natural and mineral resources, and waste administration; and national and regional territorial plans for urban and rural areas, industrial areas, coastal areas, tourist areas, protected areas, and those areas either damaged or highly sensitive to pollution.

The state authority or natural and legal entity representing a proposal listed above, prepares the SEA report and submits it to MEFWA.

3.2.4 Tenure Issues

Under the 1996 Water Law "On Water Resources", the state owns all water resources in Albania. The Water Law provides that surface water may be used freely for drinking and other domestic uses, such as livestock watering, so long as the use is limited to individual and household needs. Water use is also subject to administrative controls imposed by water authorities. Water authorities may restrict free use of water during periods of water shortages or in the event of contamination. Law no. 111/2012 "On Integrated Water Resources Management", retains these provisions.

Non-domestic water users, and users of groundwater for domestic purposes must obtain permission, authorization, a concession, or a license from the appropriate water authority, subject the following conditions:

- **Permission.** Water authorities may grant administrative permission for the use of underground water for any purpose, water supplied by permanent installations, and water used for irrigation, livestock, aquaculture, and industry. Permission is also required for planting of trees and crops on river beds and the removal of solid material from river banks. Permissions are granted to WUOs for 10-year periods and 5 years for all other users.
- **Authorization**. Authorizations for water use necessary for research, exploration, and study of surface and groundwater are available for periods up to 2 years.
- **Concession**. Water authorities may grant concessions for the use of surface and groundwater for public purposes, including hydropower stations, supply of potable water, and irrigation by agricultural enterprises. Concessions are available for initial terms of 30 years with a potential 10-year extension. The hydropower concessionaires will have to abide by operating rules that will be established in consultation with other parties, and facilitated by the River Basin Agency
- **License.** Commercial well drillers must obtain a license and separate permission for every well drilled.

Law no. 8518, dated 30.7.1999 "On irrigation and drainage", and amended by Law no. 9860 dated 21.01.2008 " aims to set up:

- the legal framework for the establishment and operation of water user organizations, federations of water user organizations and drainage boards;
- the determination of institutional framework which will serve to a national policy for irrigation, drainage, flood protection and erosion;
- the determination of rights and duties of individuals and legal entities involved with irrigation, drainage, flood protection and erosion;
- the adjustment of transferring irrigation systems to water user organizations and federations of water user organizations; and
- the regulation of transfer of drainage systems and flood protection works to the drainage boards.

The new Law no. 24/2017 "On Administration of Irrigation and Drainage", defines MARD as the main authority responsible for directing the overall management of irrigation systems, drainage, flood protection and reformation of this sector, while systems management is performed through a separation of roles and responsibilities between the Regional Directorate of Irrigation and Drainage, municipalities and the water use organizations.

Law no. 8681, dated 2.11.2000 "On the design, construction, use and maintenance of dams and dumps" This law aims to build basic legal and institutional framework from which will flow all the documentation governing the process of design, construction, use and maintenance of dams / dumps.
The law defines the state authorities that conduct their activity in the field of dams / dumps, design criteria and rules of dams / dumps and criteria on ownership and exploitation of dams / dumps

Decision of the Council of Ministers of the nr.147, dated 18.3.2004 "On approving the regulation for the safety of dams and dumps"

The regulation aims to establish rules that seek the safety of dams / dumps, including the processes of design, construction, use and maintenance of them, to enable the implementation of complex requirements (or special requirements) for the exploitation of water resources, security of the population and economic values on river basins, at all stages of life of the dam / dumps.

The regulation for the safety of dams/dumps is required to be implemented on dams/ dumps that meet the requirements of Article 3 of Law nr.8681, dated 2.11.2000 "On the design, construction, use and maintenance of dams and dumps" from all ministries, institutions, state enterprises, owners and users that conduct their activity in research, design, construction, use and maintenance of dams / dumps in Albania, as well as by the national control organisms.

3.2.5 Land Expropriation and Compensation

In the Republic of Albania the legal framework for expropriation of land and resettlement issues mainly consist of the following legal acts:

- The Constitution of the Republic of Albania.
- Law No. 8561 dated 22. 12. 1999 "*On Expropriations and Temporary Takings of the Private Property for Public Interest*"
- Law No. 9235, dated 29.7.2004 "*On restitution and compensation of private properties*"
- Law No. 9482, dated 3.4.2006 "*On legalization, urbanization and integration of informal properties*"
- The Council of Ministers Decision No. 138 dated 23. 3. 2000 provides the legal criteria for the evaluation of properties affected by expropriation.
- Council of Ministers Decision No.438, dated 28.6.2006 "*On the criteria, procedures and required documentation that determine legalization of informal properties*"

Further details on these legal documents are contained in the Resettlement Policy Framework (RPF) which is a separate deliverable.

3.2.6 Other Legal Acts

The following are other legal acts of relevance to the project:

- Law nr.7872, dated 9.11.1994 "On Ratification of the" Development Credit Agreement for the Irrigation Rehabilitation Project between Republic of Albania and the International Development Association (IDA)"
- Law nr.7974, dated 26.7.1995 "On the ratification of the" Loan Agreement between the Government of the Republic of Albania and Kuwait Fund for Arab Economic Development for the Irrigation Rehabilitation Project "
- Law no. 8309, dated 18.3.1998 "On ratification of the" Loan Agreement between the Government of the Republic of Albania and the Islamic Development Bank for the Plain Irrigation Project of Korça"
- Law nr.8533, dated 14.10.1999 "On the ratification of the" Development credit agreement between the Republic of Albania and the International Development Association (IDA) for the Second Project of Rehabilitation of Irrigation and Drainage "
- Law no. 8819, dated 27.9.2001 "On ratification of the" Loan Agreement between the Republic of Albania and Kuwait Fund "For Arab Economic Development," Project for the Rehabilitation of Irrigation II"
- Law no. 9311, dated 11.11.2004 "On the ratification of the" Credit Agreement between the Government of the Republic of Albania and the International Development Association (IDA), Project Management for the Water Resources "

- Law nr.9336, dated 16/12/2004 "On ratification of the" Credit Agreement between the Government of the Republic of Albania and the OPEC Fund for the International Development Project of Water Resources Management "
- Law no. 9349, dated 03.03.2005 "On ratification of the" Credit Agreement between the Government of the Republic of Albania and Kuwait Fund for the Arab Economic Development for the Irrigation Rehabilitation Project (Phase III)"
- The National Water Strategy has been approved by VKM no. 273, dated 7.5.2004.
- The draft Water Management Law circulating in 2010 maintains the system of water rights set forth in the 1996 Water Law. In addition, the draft law adopts a national water strategy and establishes river basin districts and a river basin-level management structure.
- Law no 7659 of 1993 on Seeds and Saplings normally referred to as Planting Stock that will be created, sold, preserved and quality controlled.
- Law No. 7722 of 1993 on conservation of the stock of medicinal ether-oleaginous and naturally tanniferous plants.
- Law No. 7929 of 1995 concerning protection of fruit trees.
- Law No 8529 of 1999 regulating the chemical fertiliser control service. This Law establishes rules and procedures for the control of chemical fertilizers, both imported or domestic, available for use in the Albanian market. Any individual or legal entity, registered according to Albanian legislation, has the right to buy and sell chemical fertilizers and is subject to this Law. The Ministry of Agriculture and Food supervises the Chemical Fertilizer Control Service which is organized and managed by the Land Research Institute. Liabilities of entities that produce or trade chemical fertilizers are established by this Law.
- DCM No. 103 of 31st March 2002 concerning environmental monitoring in the Republic of Albania. This concerns environmental monitoring, i.e. the programme of systematic measurement, observation and reporting of environmental indicators. The latter are defined as the variables which give information on a particular environmental phenomenon and make it perceptible by assigning it to a numerical value for purposes of measurement and communication.

3.3 Institutional Framework

The National Water Council, which is under Albania's Council of Ministers, is the primary authority responsible for water resources management. The National Water Council has responsibility for: proposing legislation; managing the drainage basin plan; approving any water management plans relating to agricultural, urban planning, industrial development or other projects; establishing necessary agencies and organizational units; and approving water concessions.

The Technical Secretariat is the executive agency of the National Water Council and has responsibility for: implementing national water policy and the legal framework; creating an inventory of water resources; issuing permissions and authorizations for water use; and promoting research and development. The General Directorate of Water Supply and Wastewater (GDWW) which is part of MIE is a public institution established by the Council of Ministers specializing in water infrastructure. The GDWW is responsible for providing technical support to the water and wastewater policies and creating the strategic framework of the water and wastewater sector.

Responsibility for municipal water utilities was devolved to Albania's local governments (municipalities). Local governments have four areas of authority: administration, investment, maintenance, and regulation.

Tariffs are based on the principle of cost recovery under the discretion of local government and within general national policies. Actual transfer of responsibility for water resource governance to local governments was a slow process that took place over several years. Most local governments were ill-prepared to take on responsibility for water distribution; they did not have sufficient human and financial capacity to create and rehabilitate infrastructure or manage the utilities effectively. Water utilities tend to have high

losses, low revenues and low collection rates. Illegal connections, especially by poor households, are common.

The municipalities have established respective units for irrigation and drainage and receive financial support from the state budget for rehabilitation of irrigation systems and operational costs.

Water User Organizations can be established at local levels to manage water resources, but for the time being their role is very weak. In many areas WUOs have been unable to maintain infrastructure for the distribution of water or to manage conflicts between different water users effectively.

3.3.1 Other key water management institutions

The Ministry of Agriculture and Rural Development
MARD is the main state institution responsible for the overall direction of the administration of water resources, irrigation systems, drainage and flood protection.

Management of irrigation, drainage and flood protection is performed through a separation of roles and responsibilities between the Regional Directorate of Irrigation and Drainage, municipalities and WUOs

The Authority of River Basins
For effective implementation of policies on water management, the territory of the Republic is divided into the 6 major water basins; and on this basis, at the local level 6 Authorities of River Basins (ARB) Operate. ARB has consultative and regulatory function and are composed of two independent institutions, the BWA and BWC

The BWC is an assembly with a specific number of representatives, while the ARB supports activities of the BWC with a permanent staff. The BWC is responsible for approving licenses (authorizations, permits and concessions) which have been previously reviewed by the ARB. The BWC also approves the plan of the management of basin water resources, the respective budget and makes the respective recommendations to the local government units for their implementation.

The Ministry of Tourism and Environment
MTE has the task of developing and implementing policies, strategies and action plans for environmental protection of forestry, fisheries and water quality control.

Ministria e Infrastruktures dhe Energjise
The role of MIE includes the drinkable water supply and the treatment of urban waste water and has key role in water use for the production of electricity and safety of granting rights contract for the construction of hydropower plants. Hydropower plants with reservoirs often become the reason of flooding due to excessive discharges in the west lowland of the country. The floods are much severe in the area of Under Shkodra because of the discharges from plants on the Drini River. The energy sector has been currently the largest user of water.

The Ministry of Interior
The Ministry of Interior through the General Directorate of Civil Emergency coordinates activities of all institutions to prevent and minimize damages from natural disasters, including floods from rivers or from possible demolition of the dams and drought that lead to reduction of water resources.

The Ministry of Finance
The Ministry of Finance, based on government priorities, allocates funds in the sectors related to water use management in the country.

3.3.2 Government Reforms, Interventions and Investments

The GoA adopted a Water Supply and Sanitation Strategy in 2003. The strategy included a short-term priority reform and investment program (2003-2006) and medium-term reform and investment program (2007-2012) to stabilize and improve water supply and sanitation services. The long term objective of the strategy for the water supply and sanitation sector is to achieve sustainable water supply and sanitation services at the EU Standards in urban and rural areas. Implementation of the ambitious strategy was slow, but by 2008, ownership of the utilities had been transferred from the government to local authorities. The utilities are not yet financially self-sustaining. With support from the World Bank, the GDWWS provides technical assistance to local government and water supply and sewage companies, including helping the water supply and sewage companies prepare five-year business plans and developing a phased program on the reduction of subsidies covering the gap between tariffs and total cost, with a goal of eliminating subsidies by 2012.

With support from the Japanese Government, the GDWWS prepared a study designed to support the regionalization of water supply and sewage utilities. In addition, the water companies serving Berat and Kuçove were successfully merged and infrastructure constructed and rehabilitated with a grant by the German Government.

The EU, Government of Germany, and other donors are supporting the GoA's effort to prepare an updated National Water Strategy, which is contemplated as part of a new Draft Water Management Law under internal consideration.

Other government projects include participation in the Albania-Montenegro Lake Shkodra Integrated Ecosystem Management Global Environment Facility, which is establishing a Bilateral Lake Management framework for the shared water resource.

Policies on integrate management of water resources are intended to promote coordinated management and development of water, land and other resources associated with them, to maximize economic and social welfare in an equitable manner, without jeopardizing the sustainability of ecosystems.

The continuous increase in demand for irrigation water the creation of a new industry increasing and the expansion and the creation of new urban areas accompanied by an increase in water consumption, especially the underground, and at the same time the increase of discharge waste water without processed, etc., have put pressure on water resources under the country in the last 20 years. In this context, the current policies aims are:

- Development of a clear institutional structure and legal, with clearly defined tasks for each of the institutions associated with effective and integrated management of water resources.
- Support for the strengthening of administrative and technical capacity of ABL, especially on planning and regulation of water use, the definition of clear and transparent criteria in the granting of permits for water use.
- Enforcement of obtaining uncontrolled gravel from river beds, which have cause degradation of the river beds and taking out of function of works of receiving water for irrigation and protective embankments.
- Improvement of system for collecting and processing of hydro-meteorological data.
- Increase the safety of dams.

In Albania, about 35% of the annual flows of water come from catchment basins in neighbouring countries, while about 50% of Albania is included in transboundary river basins. On use of transboundary watercourses and reaching agreements, the GoA has established an inter-ministerial committee that are supported by a technical working group with representatives of institutions related to water.
Albania has several agreements with neighbouring countries over the use of water resources, but they are

quite outdated and not suitable for the new geopolitical realities and developments in the field of energy, tourism, agriculture etc. That said, Albania has ratified in 1994 the UNESCO Convention on "Protection and Use of Transboundary Watercourses and Lakes" and in 2002 a "Protocol on water and health". Albania is also involved in the implementation of several environmental projects for transboundary lakes as Lake Ohrid, Lake Prespa and Lake Shkodra.

3.3.3 Inter-sectoral Strategy for Agriculture and Rural Development 2014-2020

The Inter-sectoral Strategy for Agriculture and Rural Development (ISARD) prepared by the Ministry of Agriculture and Rural Development (MARD) has been elaborated in accordance with the framework of the Europe 2020 strategy for smart, sustainable and inclusive growth and the overall strategic goal of Albania becoming an EU member.

The strategy has been prepared in line with the EU strategic planning approach for the Common Agricultural Policy (CAP) 2014-2020, while maintaining focus on the specific needs for development of agriculture, agro-processing and rural areas in Albania. These needs and challenges are mapped and analysed in a number of sector analyses and surveys accomplished as part of the strategy preparation process.

The main objective of ISARD is to establish the strategic framework to address the challenges facing the agricultural and agro-processing sectors and the economic, environmental and socially sustainable development of rural areas. It aims to do this by proposing policy instruments similar to CAP instruments with a specific focus on preparing the sectors, the policy instruments and the institutional arrangements for EU accession, to sustainably improve the competitiveness of Albania.

Under WRIP, a draft strategy for irrigation and drainage has been developed and will adopted by the government in coming months.

4 PROCEDURES FOR ESIA

The Consultant understands that the WRIP was prepared as an environmental **Category B project** under the World Bank operational policies and safeguard requirements. It is not foreseen to change the safeguards category. Activities carried out under the WRIP will also need to conform to current Albanian Environmental Regulations and the procedures of the World Bank's Safeguards Policies.

The Albanian Law on Environmental Protection requires that any project or activity that will affect, or is likely to affect the environment, has to receive an Environmental Declaration, Environmental Permit, Consent or Authorization by the MEFWA before implementation may commence.

The Albania EIA procedures are generally in line with the World Bank's EA process, as all projects require environmental screening and possibly assessment in order to receive an Environmental Declaration (for construction), and/or an Environmental Permit (for an activity having an impact on the environment, including some construction activities). Furthermore the type and scale of the impacts the project will have on the environment determine the procedures that have to be followed and the type of approval granted. Also all the approvals include conditions that shall be observed by the proposer including environmental monitoring and mitigation requirements.

The difference lies in the scope of the EIA required for those projects that fall into World Bank Category B and the Albanian Law on EIA Appendix II. Some projects may be considered slightly differently under the World Bank screening process, but still require a detailed EIA, while the same activities/projects under the Albanian Law will require only a Summary EIA, unless the REA decides that the project must undergo a thorough or complete EIA.

4.1 Proposed Screening Process

To streamline the EA screening process for WRIP it is proposed to adopt the approach shown in Table 4-1 for all the sub-projects (individual irrigation dams, reservoirs and I&D schemes).[1]

Table 4-1: Proposed Screening Criteria for World Bank and Albanian EA Procedures

World Bank Category	Category As Per Albanian Legislation	Procedure To Be Followed (Meeting both Albanian and World Bank standards)
B[2]	Annex 1 and 2, MEFWA Guidance No. 3, dated 08/17/2004[3]	Site specific ESMPs will be prepared by the MAFCP (to meet both Albanian and World Bank requirements) split into two sections, i) covering the dam safety rehabilitation and ancillary work and ii) covering the I&D scheme rehabilitation. The 13 site specific ESMPs will be prepared for every reservoir (Kurjan and Strum share the same reservoir) that will be rehabilitation during the first year of WRIP and then separate site specific ESMP for each I&D scheme selected during the second year of WRIP. The content of the Site Specific ESMP will essentially cater for the requirements of the Summary EIA required under Albanian law, but this will need confirmation by the relevant REA. A number of sample site specific ESMPs have been prepared to provide guidance for the preparation of the 13 final site specific ESMPs. One public consultation will be held for each reservoir or I&D sub project. ME approval of site specific ESMPs will be obtained, and the relevant environmental permit issued.

[1] For a more detailed breakdown of the screening process, refer to Table B2 in Annex B of this ESFD.
[2] In case a Category B sub-project is listed in the EIA Law Appendix 2, the EIA will be prepared in parallel with the ESMP to MEFWA requirements
[3] On Approval of the List of Business Activities, Application Forms and Rules and Procedures to Grant Environmental Consent and Authorization from the Regional Environmental Agencies (REA)

World Bank Category	Category As Per Albanian Legislation	Procedure To Be Followed (Meeting both Albanian and World Bank standards)
		The World Bank will review and provide no objection to the consultation result of the Site Specific ESMPs.

Full details of the screening criteria required under Albanian law and WB OP4.01 are contained in Annex B of this ESFD. It is clear that the nature of the sub-projects as they stand at this stage is WB Category B. The planned content of the site specific ESMP will cater for the requirements of a Summary EIA document as per Albanian law.

The technical design of a sub-project will integrate the findings and comments originating from the EIA (or in this case the site specific ESMP) and include recommendations made for the design and the mitigation of the impacts expected, as well as the conditions of any environmental approval granted.

The components of the WRIP will be prepared and implemented according to Albanian legislation, regulations and standards and to comply with the operational guidelines and directives of the World Bank. As mentioned in the previous chapter, the Albanian legislation is in the process of being harmonized with the EU legislation.

In view of the development objectives of Albania, related EU directives will be reviewed and, to the extent practicable and feasible, applied to any project investments subsequently proposed or yet to be implemented. In case of non-compliance with EU directives, the sub-project proposal should provide reasons why this is not possible.

The MARD/MTE will be responsible for the screening process and ensuring that the Local Government Units (LGUs) follow the required environmental procedures. The The MARD/MTE shall monitor and support the screening process and satisfy itself that the procedures are being followed to the satisfaction of the Albanian Law and World Bank policy. In the event of any deviations or unreasonable delays it shall seek the advice of the relevant party/parties and provide any necessary support and advice to overcome/correct the problems.

The process will comprise three steps:

Step 1: Screening: The MARD/MTE will determine the type of environmental approval required in accordance with Appendixes 1 and 2 of the Law on EIA, other relevant legislation[4], and according to the classification presented in Table 4-1 above, and prepare and submit the request and the necessary documents to the Regional Environmental Authority (REA)[5]. Within five (5) days of receiving the request, the REA will review the required documentation, classify the proposed sub-project in accordance with Appendixes 1 and 2 of the Law on EIA and other relevant legislation, and the classification presented in Table 4-1. It shall decide whether the sub-project will require an EIA, and then decide whether it should undergo a Summary EIA, a Summary EIA enhanced to match WB requirements (Category A EIA), or a Profound EIA, and advise the LGU/sub-project proposer accordingly. This process has concluded that the sub projects warrant an ESMP to be prepared which essentially covers the requirements of the Summary EIA content under Albanian law, but the final say rests with the relevant REA.

Step 2: Environmental Assessment: According to the screening decision on the type of EIA required (if any), the LGU/sub-project proposer shall proceed as indicated in Table 4-1 and the accompanying notes above (also refer to Annex B of this ESFD). In the case that an EIA is required, this process shall include

[4] including MEFWA Guidance No. 3, dated 08/17/2004
[5] see Council of Ministers Decision, No. 249, dated 24. 04. 2003, Concerning the Endorsement of Applications for Environmental Licenses and Information Items in the Environmental License, and MEFWA Guidance No. 3

preparation of the ToR for the EIA and procuring and engaging EIA specialists according to the procurement rules for the WRIP.

For any EIA required, the REA shall inspect the EIA report and the data presented and shall consult with its experts and other appropriate bodies, e.g. cultural heritage, environmental groups, etc. It will then prepare, in writing, a recommended decision in favour of approval or refusal of the sub-project, with justification(s). In the case of approval of the application it shall also propose any environmental conditions, monitoring requirements, etc., to be included in the approval. This decision shall be forward to the MEFWA within twenty (20) calendar days of the submission of the EIA report, accompanied by the EIA report. The MEFWA shall review this decision, seek expert advice, etc., as required and either approve or reject the application, with the necessary justification. When no EIA is required, the REA, or the MEFWA[6], shall issue the relevant environmental approval[7], with any environmental conditions, monitoring requirements, etc., after review of the sub-project design and the ESMP.

Step 3: World Bank Approval: On receipt of the environmental approval by the MEFWA the LGU/sub-project proposer will forward a copy to the MARD, accompanied by the documentation required for review by the World Bank. MARD shall satisfy itself of the appropriateness of the decision, confirm to the Bank that the applicable environmental procedures have been followed, and submit the documentation for review.

The World Bank will review the information provided and, if it considers the assessment and the ESMP are appropriate and satisfactory, will provide a 'no objection' and the sub-project may proceed to design completion and for Construction Permit, and implementation, alternatively it will suggest areas where strengthening is needed before the above process can be completed.

4.2 Public Consultation

Chapter 11 of this ESFD provides more information on the public consultation process, but the procedures and relevant legislative requirements are described below.

4.2.1 Stakeholders

The main goal of the stakeholder and public consultation implemented for the various components/ sub-projects/ activities under the project will be to prepare a framework that will facilitate a consensual project implementation, ensure that they will be in compliance with Albanian laws, regulations[8] and customs as well as with the Bank's policies, and that they will not have a lasting adverse negative impact on the local population, the natural environment or properties of particular cultural value, whether on the site or elsewhere.

The stakeholder and public consultation plan required under Albanian law includes identification of the stakeholders and public representatives that should participate in the process and the approach to be used.

Albania is an emerging economy and society; it is therefore possible that new stakeholders will emerge during the life of the WRIP, some will disappear, and that the relevance of some existing ones will change. The identification and selection of the main stakeholders will therefore be carried out regularly, using a screening process based on the roles and responsibilities of each stakeholder at each stage of the sub-project cycle. The MARD and MTE will need to monitor and advise on any modifications required if they are not implemented automatically by the responsible bodies in the field.

[6] as determined by MEFWA Guidance No. 3, dated 08/17/2004, and other relevant legislation
[7] Environmental Declaration for construction, etc, Environmental Permit, Authorization or Consent for the exercise of any activity having an impact on the environment
[8] This shall include any changes expected as a result of harmonization with EU policies and procedures.

The main **national stakeholders** are considered to be MAFCP and MTE. The role and relevance of each national stakeholder will change depending on the issues to be consulted.

The main **local stakeholders** are considered to be Districts and the local government units (LGUs), i.e. the municipalities and their urban offices, the REAs and Local Environment Inspection offices. Other stakeholders may be identified in the design of project components and sub-projects.

The main **public representatives** are local NGOs active in the region, social associations, business community organizations such as local Chambers of Commerce, hoteliers associations, tourism associations etc.

4.2.2 Procedure for Public Consultation

For projects falling in World Bank Category B projects, the responsible LGU with support of MARD/MTE will consult the project affected groups and local NGOs about the sub-project's environmental aspects and take their views into account. This will be done according to the procedures defined in the Albanian Law on EIA, as developed more precisely in the Public Participation Regulations Nr.1 "**On Public Participation of EIA process**" issued by MTE, dated 17.08.2004 (Nr 233 of Prot.). This Regulation is drafted to apply to Article 26 of the EIA law. Where this process is not sufficient to meet WB policy requirements they will be enhanced. Broadly these requirements are as follows:

Category B: The public consultation will occur when the ESMP is in a draft phase and the findings of the draft ESMP will be discussed. The views of the public will be incorporated in the final ESMP. The stakeholder and public consultations will be carried out either as a sector approach or as a multi-sector approach, depending on their type. Both approaches will comprise a set of consultation measures to be designed and implemented from the beginning of the activity/action through to its end. This should also include any procedures required for the operation phase, especially performance monitoring.

The public and stakeholder consultation and participation will be realized through:

- information to public and stakeholders about a component, sub-project or activity, including access to key data and indicators in hard or electronic copy;
- Ensuring conditions that maximize opportunities to express opinions and participate in the decision making process, though public debate and other consultative processes:
  - Public meetings
  - Workshops
  - Exhibitions
  - Individual meetings with stakeholders
  - Distribution of questionnaires
  - Advertisement, notices , media
- Consideration of any proposals for improvements and ways to make them;

Preparing and implementing the consultation process will comprise the following steps:

- Identification of national and local stakeholders and public representatives as suggested above;
- Preparation of the simple and adequate information of the activity/action to be displayed to stakeholders and information to public;
- Determination and organization of the events required;
- Facilitation of the events;
- Recording the information and opinions and advice obtained;
- Consideration of the above information in finalizing the design and the operation and maintenance arrangements, etc.; and
- Co-ordination of the time table/schedule for each of the above steps.

The public consultation process has already underway and minutes of meetings are included in this ESFD document (Annex C)

5 THE PROPOSED PROJECT

The WRIP responds to requests from MARD and the Department of Strategy of Donor Coordination (DSDC), and integrates strategic support for IWRM and institutional support and investments in the rehabilitation of reservoirs and associated irrigation and drainage (I&D) infrastructure, to be implemented by MARD.

5.1 Project Objectives

The project development objective is to increase the area under improved I&D, to improve the safety of dams and to establish the institutional basis for improved IWRM in the two priority river basins (Drini and Seman rivers).

The project aims to capture synergies and evident opportunities for win-wins between water resources management and irrigation, by far the largest – and most inefficient – user of water. Promoting water use efficiency in irrigation schemes will increase farmers' incomes and strengthen water resources management. Addressing dam safety issues will enhance their functionality for flood management, while at the same time improving the quality of irrigation service delivery. Improving farmers' incomes will enhance the resource base for IWRM, which will, in turn, require relevance of rational water resources management to a large segment of the population to ensure involvement and ownership. Support for the preparation of agreed river basin management and development plans will tie the preparation of an IWRM Strategy *at the national level* to structural and non-structural improvements in the quality of water services delivery *at the local level* that are of immediate relevance to large numbers of water users.

As part of the preparation of the proposed WRIP to be financed by the World Bank (WB), the Government of Albania (GoA) wishes to carry out an Environmental and Social Impact Assessment (ESIA), Resettlement Policy and Baseline Surveys to assess the potential environmental impacts of the project, prepare an Environmental and Social Framework Document (ESFD)[9], prepare 13 site-specific ESMPs and Social Impact Assessment Report for sub-projects that will be executed during the first year of project implementation, prepare a Resettlement Policy Framework (RPF) prepare specific Resettlement Action Plans[10] (RAPs) for the initial first year's dam rehabilitation projects and carry out baseline studies of irrigated perimeters served by each dam

5.2 Project Components

The proposed project will comprise of the following components:

- Dam and I&D Systems Rehabilitation
- Institutional Support for Irrigation and Drainage (I&D)
- Institutional Support for Integrated Water Resources Management (IWRM)
- Implementation Support

5.2.1 Component 1: *Dam and I&D Systems Rehabilitation*. This component will be implemented by MAFCP. The objective is to rehabilitate (and, where possible, modernize) I&D systems and dam infrastructure. The intermediate results indicators include the number of dams rehabilitated in compliance with international dam safety standards, number of dams where emergency response plans have been prepared

[9] World Bank Operational Policy 4.01 for Environmental Assessment. Visit the World Bank website at worldbank.org/safeguards to review the safeguards policies and related materials.
[10] The World Bank policy on Involuntary Resettlement OP /BP 4.12

and disseminated to the population, water users (including female farmers) provided with improved I&D services, and area with rehabilitated/modernized I&D infrastructure (ha). Safeguards indicators are number of site specific Environmental and Social Management Plans (ESMPs) and number of Resettlement Action Plans (RAPs) prepared.

The component will finance the following sub-components:

(a) *Rehabilitation and modernization of selected dams and I&D systems.* This sub-component will finance preparation of all feasibility and detailed design studies, and all rehabilitation and modernization works of 14 dams and associated I&D systems, as well as the supervision of the works. Investments will be mostly located in the Drin-Buna and Semani river basins, and will be undertaken in a comprehensive way (i.e., investments will be done as much as possible in dams and in associated I&D systems) to maximize the returns on investments.

(b) (i) *Preparation and implementation of safeguard instruments* and measures associated with the rehabilitation and modernization activities under Component 1(a), including ESMPs and RAPs, and (ii) *strengthening the framework governing safety of agricultural dams*, including capacity strengthening and awareness raising, and preparation of emergency preparedness plans, supervision and quality assurance plans, and dam safety O&M plans, including an instrumentation plan.

(c) *Preparation of a pipeline of investments* in irrigation, drainage and dam infrastructure rehabilitation, including carrying out of feasibility and detailed design studies and related safeguard instruments. This sub-component will finance all studies required to prepare a pipeline of shovel-ready investments in irrigation, drainage and dam infrastructure rehabilitation in a total amount of US$50 million for investment in a subsequent investment operation.

5.2.2 Component 2: *Institutional Support for Irrigation and Drainage.* This component will be implemented by MAFCP. The objective is to improve the performance of organizations that provide irrigation services. This includes institutional reforms and capacity strengthening of LGs, DBs and WUOs, and piloting PPP in I&D service delivery through recruitment of third party operators to deliver irrigation services in three I&D pilot schemes. The component will also finance preparation of a National I&D strategy. Intermediate results indicators include irrigation transfer contract between MAFCP and LG prepared, number of (female) farmers trained, number of I&D transfer agreements signed, number of Bulk Water Delivery contracts signed between DBs and WUOs, I&D strategy prepared, operational WUOs created and/or strengthened, and number of PPP contracts signed.

The project will finance the following sub-components:

(a) *Institutional reforms of I&D sector.* Definition of responsibilities for O&M of I&D systems among stakeholders (including Ministry, DBs, LGs, WUOs and private operators) through, inter alia, (i) preparation of a National I&D strategy; (ii) development of cooperation arrangements (including contractual arrangements) among agencies including through provision of consultants services; (iii) development and formalization of I&D service delivery standards; and (iv) development and carrying out of small scale pilots in public-private partnership, including outsourcing O&M of I&D schemes to private operators.

(b) *Strengthening the capacity of organizations* that provide I&D services and the capacity of stakeholders (including Ministry, DBs, LGs, WUOs and private operators) inter alia, through provision of goods and training in areas, including contract management and outsourcing, administration, financial management and procurement, and water management and O&M. The project will train an estimated 10 civil servants from MAFCP, 15 civil servants from five

DBs, staff from 15 LGs, and office bearers from 15 WUOs. Decentralized WUO support staff from DBs and LGs will be trained in strengthening capacities of WUOs. Some goods will be procured for DBs and LGs.

5.2.3 Component 3: *Institutional Support for Integrated Water Resources Management*. Its objective is to establish the strategic framework to manage water resources at the national level and at the level of the Drin-Buna and Semani River basins. Capacity strengthening activities, critical for satisfactory water sector performance, will be fully integrated into each of the subcomponents to ensure their relevance and applicability. During project preparation, a number of activities have been undertaken, including preparation of TORs for developing a National IWRM Strategy and establishing a Water Resources Database. The recommendations of these preparation activities will be implemented once the project is effective. The intermediate results indicators are number of (female) staff trained in IWRM, percentage increase of budget allocation to RBAs. Throughout project implementation, MARD is expected to increasingly demonstrate leadership in the management of the country's water resources, and to progressively show responsibility as convener of stakeholders in water resources management.

The project will finance the following sub-components:

(a) *Preparation of a National IWRM Strategy* including establishment of a stakeholder forum for cross-sectoral dialogue and decision making under the aegis of the NWC, and strengthening capacities of institutions responsible for IWRM, such as the NWC, TS, and the RBCs and RBAs of Drin-Buna and Semani basins. In view of EU candidate status, the strategy will incorporate the EU's WFD, as reflected in the Law on Water Resources. The project will ensure inclusiveness of the preparation process by involving all stakeholders involved in the management of water resources. A communications strategy will be prepared and implemented to accompany the investments and the preparation of the strategy.

(b) *Preparation of River Basin Management Plans* for the Drin-Buna and Semani river basins including identification of structural and non-structural measures to improve the quality of IWRM and strengthening capacity to implement said plans through provision of training and goods to River Basin Agencies and minor rehabilitation of their offices.

(c) *Establishment of a consolidated Water Resources Database* to be used as basis for national water resources planning and programming. The database will be established within MARD. The proposed water resources database will be populated through the coordinated acquisition of monitoring data from all relevant organizations involved with water resources monitoring.

5.2.4 Component 4: *Implementation Support.* This component will be implemented by MARD. Its objective is to manage project resources in accordance with the project's objectives and procedures as outlined in the POM. The intermediate results indicator is the number of project monitoring reports based on the established Management Information System (MIS) submitted on time.

The project will provide support for the implementation of the project, including provision of technical assistance, training and goods, and establishment and implementation of a performance based management information system:

(a) *Project Management*. Project implementation will be mainstreamed into the regular functions of the implementing Ministry. Support for project implementation will include: (i) provision of technical assistance, training and office equipment, and incremental operating costs in support of project management; (ii) overall project planning, quality oversight and evaluation of project activities; and (iii) strengthening procurement and financial management ca-

pacity at all levels.

(b) *Establishment of a Monitoring and Evaluation system*. The project will support the establishment of a performance based MIS and arrange for data collection and reporting on key performance output and impact indicators, through a baseline surveys (completed during during project preparation) and follow up surveys at the Mid-Term Review and at project completion.

5.3 The Project Area

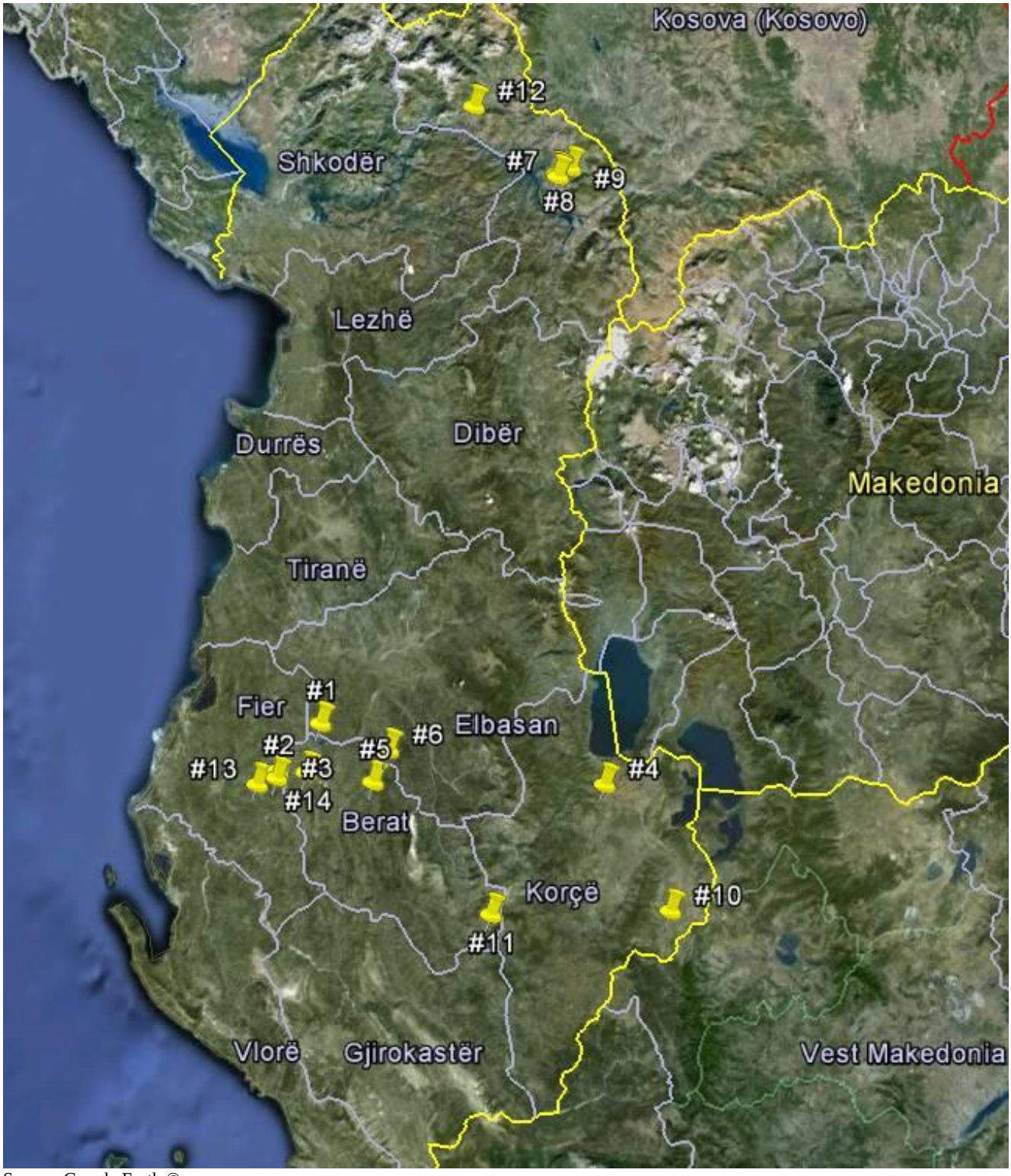
5.3.1 Location

The project in the first and second year consists on rehabilitation and revitalization of 13 agricultural reservoirs (two dams –Kurjan and Strum share the same reservoir) and associated I&D schemes, located at Northern part of Central Mountain Region, Southern Part of Central Mountain Region, on Intermediary Zone of Adriatic Pre Lowland Region, on the Intermediary Zone of Hilly Central Region, and on the Intermediary zone between Hilly Central Region and Southern Mountain Region.

All reservoirs and associated I&D schemes were built during the so called "Central Economy period" for irrigation purposes. Most of such reservoirs were and still are used also for fishing. Because of the fairly long period of their existence; some of the reservoirs are more than 50 years old; these water bodies are considered almost "natural" in character. Notwithstanding, the reservoir biodiversity is actually not that natural, and in the past several fish species were introduced to control eutrofication (by fish grazing the water plants) and to be used as source of food.

The approximate location of the dams, reservoirs and I&D schemes under review are shown on the satellite image in Figure 5-1 below. Essentially there are three groupings of dams:

- Group 1 focused around Kukes and Tropoja comprising #7, #8, #9 and # 12
- Group 2 focused around Korca comprising #4 and # 10; and
- Group 3 focused around Fier and Berat comprising #1, #2, #3, #5, #6, #11 #13 and #14.



Source: Google Earth ©

Figure 5-1: Location of the Project Area

The numbers on the Figure 5-1 can be cross referenced with the list of reservoir , dam names and irrigated areas shown in Table 5-1 below. It can be seen that the sites are widely dispersed within the two river basins of Drini-Buna in the north; and the Seman with the sub basins of the Devolli and Osum rivers up-stream, in the south central region of Albania.

5.3.2 Key Dam Reservoir and I&D Information

Key information on the dam, reservoir is shown in Table 5-1 below.

Table 5-1: Details on the Location and Statistics of Dams and proposed I&D areas

Nr.	Dam	Latitude	Longitude	Town Nearby	Proposed Irrigated Area Hectares	Total Storage Mm3	Dam Height m	Dam length m	Population Affected
1	Murriz Thana Dam	19º 50’ 06’’ E	40º 51’ 21’’ N	Lushnje	42,000	66.00	17	3570	210
2	Kurjan Dam	19º 43’ 31’’ E	40º 43’ 19’’ N	Fier	6500	31.5	17	540	350
3	Strum Dam	19º 43’ 36’’ E	40º 44’ 19’’ N	Fier	6500	NA	17	700	80
4	Leminot Dam	20º 41’ 33” E	40º 47’ 51” N	Korça	400	1.20	33	180	1300
5	Duhanas Dam	20° 00' 44" E	40°44' 26" N	Berat	200	1.90	39	235	420
6	Belesova Dam	20º 02’ 45” E	40º 48’ 59” N	Berat	912	1.40	42	304	200
7	Tregtan 2 Dam	20º 20’ 25’’ E	42º 08’ 15’’ N	Kukes	17	0.06	10	254	30
8	Tregtan 3 Dam	20º 20’ 10’’ E	42º 08’ 37’’ N	Kukes	315	0.95	32	137	30
9	Vranisht 2 Dam	20º 22’ 28’’ E	42º 09’ 36’’ N	Kukes	217	0.65	27	158	60
10	Koshnica 1 Dam	20º 55’ 38’’ E	40º 32’ 01’’ N	Bilisht	800	2.35	31	300	10
11	Staravecke Dam	20º 24’ 13’’ E	40º 28’ 43’’ N	Skrapar	60	0.15	30	170	50
12	T’Plan Dam	20º 03’ 49’’ E	42º 16’ 11’’ N	B. Curri	600	1.80	25	360	15
13	Zharrez Dam	19º 40’ 13’’ E	40º 42’ 06’’ N	Fier	600	1.90	22	520	390
14	Slanica	19º 48’ 39’’ E	40º 44’ 33’’ N	Berat	230	0.80	32	250	75
	Total				**51,851**	**104.65**			**3220**

Group 1 Dams
Group 2 Dams
Group 3 Dams

The reservoirs and I&D schemes are located close to inhabited sites, most of them close to villages, and some close to the cities. The regions/prefectures of Korça, Berat and Fier (9 of the reservoirs and I&D are situated in these three prefectures), are some of the most important municipalities of Albania.

Agriculture remains the most important economic output for those municipalities. The others, are situated in Skrapare and Kukes (and close to Bajram Curri) municipalities, and represent a very important instrument for agriculture development.

The agricultural industry of Albania was fundamentally changed at the beginning of the 1990’s. In the 1980s towards the end of the Hoxha regime approximately 700,000 hectares of agriculture land existed and 52% of this was irrigated (Volgi 2012). The industry comprised of large state or co-operative farms and by 1983 when the collectivisation process was largely complete the average farm size was 1320ha (Halcrow, 2001).

In the beginning of the 1990, the Democratic Parliament approved the new law of “The Land”, when the land was separated between peoples that worked on it, or administrated it regardless of whether they had inherited it from their forebears.

More recently, the Law of “The Land” has undergone revision and improvement with the introduction of new by-laws made by decisions from the council of ministers (DCMs) who are trying to give legal right of ownership of agricultural land to those that have inherited it, but this policy has not been fully imple-

mented till the present day. Most farms now typically comprise of three non-contiguous blocks of land, such that most farms can be considered smallholder and part time affairs. These smallholdings are now of average size of 1.11ha (MAFCP, 2010), with the total amount of agricultural land now being approximately the same as the pre-1990 figures at 695,000 ha. However in 2010, only 29.4% of this land was irrigated (MAFCP 2010), primarily due to breakdown of ageing system, no rehabilitation and no maintenance.

5.3.3 General Description of Reservoirs and I&D Schemes

The irrigation schemes at their peak functioned very well and were characterized with inlet and outlet channels (with some exceptions) and functioned with either a gravity fed scheme or with a pumped section in the original design. Over the course of time and with no maintenance, many of these schemes have become inefficient and much of the irrigated areas have been reduced due to failure of the pumped sections, siltation of the irrigation channels, or serious erosion and siltation in the reservoir and dam structure. Only 44% of the intended irrigated areas are now watered. This can be seen in the Table 5-2 below.

Table 5-2: Summarised Data on Irrigation and Drainage Schemes

Scheme Name	Total Design Irrigation Area (ha)	Design Irrigated area Gravity (ha)	Design Irrigated area Pumped (ha)	Estimate of Current Irrigated area Gravity (ha)	Estimate of Current Irrigated area Pumped (ha)
T'plan	470	205	265	30	0
Vranisht 2	217	217	0	50	0
Tregtan 2	28	28	0	15	0
Tregtan 3	315	215	100	155	0
Murriz Thana	29,300	27,590	1,710	15,000	0
Kurjan	6,200	5,300	900	2,100	0
Strum	DATA INCLUDED UNDER KURJAN				
Zharrez	600	600	0	300	0
Slanice	320	300	20	150	0
Belesova	1,280	1,150	130	100	0
Duhanas	550	280	270	50	0
Staravecke	80	80	0	20	0
Leminot	400	400	0	250	0
Koshnica 1	850	350	500	0	0
TOTAL	**40,610**	**36,715**	**3,895**	**18,220**	**0**

Source: Adapted from Mott MacDonald Feasibility Study

Essentially all dams require some rehabilitation work; some more than others. For example, Koshnica 1 needs to have the dam rebuilt due to a historic slip, Murriz Thana, Staravecke and T'Plan all have some stability issues than need to be addressed. A geotechnical survey is planned to be undertaken at all 14 dam sites during detailed design which is planned in the first year of WRIP (indicated as Phase 2 in the Mott MacDonald Study). Siltation is a significant concern at Belesova and Zharrez.

The Feasibility Study by Mott MacDonald provides details of the main rehabilitation works to be undertaken at the dams under review, and some general indications of the potential options for I&D scheme rehabilitation. An important issue however is that four sites are planned to have their spillway crest raised by between 0.3 and 0.5 metres (Zharrez, Slanica, Belesova and Duhanas). This will increase the reservoir area at TWL and may impact on land around the existing reservoir shoreline. Details of the extent of the flooded area are not known at this stage, but will become apparent during the detailed design. This land surrounding these specific reservoirs is state owned and no private individuals will be affected.

Data on Group 1 Reservoirs and I&D Schemes

There follows information on the Group 1 reservoirs and I&D schemes which has mainly been taken from the Feasibility Studies from the Design Consultant (Table 5-3). The majority of this information is tabulated as follows:

Table 5-3: Tabulated data on Group 1 reservoirs and I&D schemes

Name of Site	Tregtan 2	Tregtan 3	Vranisht 2	T'Plan
Date constructed	1969	1989	1970	1974
Dam length (metres)	254	137	158	360
Dam height (metres)	10	32	27	25
Capacity at TWL m^3	56,000	945,000	650,000	1,800,000
Surface area at TWL (hectares)	3.5	11.8	6.8	17
Design irrigated area (hectares)	28	315	217	470
Road access to site	poor	poor	poor	No access
Surrounding geology	sandstone	sandstone	sandstone	Sandstone, siltstone, peat
From geological map	Pyroxenite	Pyroxenite	Pyroxenite	Evaporite
Reservoir Catchment area (hectares)	35	79	730	195
People considered at risk	30	30	60	0
Any protected areas downstream?	No	No	No	No
Any archaeological site downstream?	No	No	No	No

Tregtan 2

Tregtan 2 Reservoir (see Figure 5-2) in Kukes prefecture is located about 11.4 km north-west of the town of Kukes. The reservoir actually impounds its direct catchment only and is understood to fill every year. Access to the dam is via a surfaced rural road for the most part. The last section (nearly 0.3 km in length) is in very poor condition. No design or construction drawings were made available at the time of the inspection and therefore only visual observations are reported here. The catchment area is made up of steep wooded slopes near the dam. Tregtan 2 reservoir collects the water from its own catchment area and the water coming through the spillway of the upper reservoir - Tregtan 1 (not considered in this project). The area immediately downstream of the dam is Tregtan 2 reservoir, hence the area can be considered as a cascade together with Tregtan 2 and 3.

The drainage to the I&D area is by a natural valley and stream, There is one branch to the irrigation main which his a small lined canal. There are no known feeder canals currently in place or in the original design. The downstream I&D infrastructure for Tregtan 2 was rehabilitated in 2008. However it is estimated that only 40- 50 % of the main canal can currently convey the design discharge. Hence only around 15ha are currently irrigated from the original design of 28ha.

Significant parts of the downstream irrigation infrastructure are in need of rehabilitation to varying extents. The current condition of the downstream irrigation infrastructure imposes a partial constraint on the original, current and future use of the scheme.

Although the Tregtan 2 dam does not currently constrain the supply of water to the I&D scheme, the dam is in poor condition and if not rehabilitated may need to be held down for safety reasons in future, which would impose a significant constraint on the original, current and future use of the I&D scheme. A total of 1.2km of main irrigation channel is planned to be rehabilitated

Figure 5-2 Aerial View of Tregtan 2 Reservoir

Tregtan 3

Tregtan 3 Reservoir (see Figure 5-3) in Kukes prefecture is located about 12.1 km north-west of the town of Kukes. The reservoir impounds its direct catchment (30%) and has two feeder canals (70%). It is understood to fill every year, if the feeder canals are cleaned and well maintained. Access to the dam is via surfaced rural road for the most part. The last part (nearly 0.3 km) is in very poor condition. No design or construction drawings were made available at the time of the inspection and therefore only visual observations are reported here. Upstream of this reservoir there two others: Tregtan 2 and Tregtan 1. Water flows from Tregtan 1 into Tregtan 2 and then again into Tregtan 3 from Tregtan 2. The catchment area is made up of steep wooded slopes near the dam. The area immediately downstream of the dam is no longer used as farmland. The valley continues as a narrow U-section with a width of 5 to 10 m for a few km.

The drainage to the I&D areas is by main and secondary canals that are lined. There are two siphons in the pumped fed area, but the pump station is not functional (the transformer still operates, but pumps and building have been removed). The downstream I&D infrastructure for Tregtan 3 was rehabilitated in 2006. However it is estimated that only 60- 80 % of the main canal can currently convey water and this has leakage problems at present. Hence all parts of the I&D system need rehabilitation. Only around 155ha are currently irrigated from the original design of 315ha (215ha by gravity and 100ha pumped).

The current condition of the downstream irrigation infrastructure imposes a partial constraint on the original, current and future use of the scheme. The condition of Tregtan 3 dam is poor with significant seepage and erosion problems and although this does not currently constrain the supply of water to the I&D scheme, the lack of a functioning feeder canal does. Furthermore, the dam is in poor condition and if not rehabilitated may need to be held down for safety reasons in future, which would impose a significant constraint on the original, current and future use of the I&D scheme. A total of 1.12km of main irrigation channel in the gravity area and 6.7km of main channel in the pumped area are planned to be rehabilitated together with rehabilitation of the existing pump station.

Figure 5-3 Aerial View of Tregtan 3 Reservoir

Vranisht 2

Vranisht 2 Reservoir (see Figure 5-4) in Kukes prefecture is located about 11.6 km north of the town of Kukes. The reservoir impounds its direct catchment only and is understood to fill every year. Access to the dam is via surfaced rural road for the most part. For the last 0.3km to the dam there is no road. No design or construction drawings were made available at the time of the inspection and therefore only visual observations are reported here. The catchment area is made up of moderately flat wooded slopes near the dam. The area immediately downstream of the dam is farmland. The valley continues as a narrow U-section with a width of 15 to 30 m for several kilometres. Some 8 houses were counted from the crest of the dam.

The drainage to the I&D area is by main and secondary canals which are lined. The downstream I&D infrastructure for Vranisht 2 has not been rehabilitated since it was constructed and has also not been maintained in decades. There are several pipes that cross the main canal from another nearby I&D scheme called Fajzes that are in a severe state of disrepair and have in turn created problems for the Vranisht 2 I&D scheme.

It is estimated that only 25- 35 % of the main canal can currently convey water and this has major leakage problems at present. Hence all parts of the I&D system need rehabilitation. Only around 50ha are currently irrigated from the original design of 217ha all by gravity.

The current condition of the downstream irrigation infrastructure imposes a partial constraint on the original, current and future use of the scheme. The condition of Vranisht 2 dam is very poor and this implies that the dam will need to be held down for safety reasons in future, which would impose a significant constraint on the original, current and future use of the I&D scheme.

A total of 3.5km of main irrigation channel before the bifurcation and a further 8km after bifurcation are planned to be rehabilitated.

Figure 5-4 Aerial View of Vranisht 2 Reservoir

T'Plan

T'Plan Reservoir (see Figure 5-5) in Kukes prefecture is located about 10.2 km south of the town of B. Curri. The reservoir impounds its direct catchment only and is understood to fill every year. Access to the dam is via surfaced rural roads for the most part. The last 500m to the dam is un-surfaced and you need to cross pasture and streams. During the visit the group walked to reach the dam. The area appears to be made up of weak red sandstones, and siltstones. The area is also known to be formed of ultra-basic rock. Immediately around the dam foundation there is thought to be some deposits of peat. The catchment area is made up of wooded slopes near to the dam. The area immediately downstream of the dam is pasture. The valley continues as a flat wide area, there are no houses within 500m downstream. Approximately 500 m downstream of the dam there is the local road.

T'Plan has a feeder canal that operates as part of the pumped canal irrigation infrastructure delivery system during the irrigation period and as a feeder canal intercepting the run-off from a nearby hillside and delivering it to the reservoir at other times. Since 1996 it has not been possible to fill T'Plan reservoir due to the identification of the cracked bottom outlet, and since this time what remained of the irrigation infrastructure has fallen into disrepair. According to the FS, the lower pumping station (P.S.1) is now missing and the land where it once stood has been ploughed. The middle pumping station (P.S.2) exists as a building in need of repair but the pumps, transformer, and connecting steel pipes are missing. The upper pump station (P.S.3) building has now been destroyed and the contents are missing. It is believed that the trace of the canals relating to the original scheme can still be seen however if this scheme was brought back into operation the entire irrigation infrastructure would need to be rehabilitated. Apparently the small area irrigated within the original scheme is believed to be irrigated by a few farmers (reported to be 18) of farm reservoirs constructed by the farmers themselves. Only around 30ha are currently irrigated from the original design of 470ha (205ha by gravity and 265 pumped).

The current condition of the irrigation infrastructure, non-functioning canals and a dam which is not safe to fill impose a significant constraint on the original, current and future use of the scheme. A total of 10.8km of main irrigation channel and 1.6km of main right branch canal are planned to be rehabilitated.

Figure 5-5 Aerial View of T'Plan Reservoir

Data on Group 2 Reservoirs and I&D Schemes

There follows information on the Group 2 reservoirs and I&D schemes which has mainly been taken from the FS (see Table 5-4). The majority of this information is tabulated as follows:

Table 5-4: Tabulated data on Group 2 reservoirs and I&D schemes

Name of Site	Leminot	Koshnica
Date constructed	1971	1973
Dam length (metres)	180	300
Dam height (metres)	33	31
Capacity at TWL m^3	1,200,000	2,350,000
Surface area at TWL (hectares)	12	18.9
Design irrigated area (hectares)	400 (150 actual)	850
Road access to site	good	fair
Surrounding geology	Weak sandstone	clays
From geological map	Clays, sands and coal	Pliocene Aleurolites
Reservoir Catchment area (hectares)	940	714
People considered at risk	1,300	10
Protected areas downstream?	No	No
Archaeological site downstream?	No	No

Leminot reservoir

Leminot Reservoir (see Figure 5-6) in the Prefecture of Korça is located about 20 km north-west of the town of Korça. It is believed that the reservoir is filled entirely by its direct catchment. A new 130m long spillway was constructed in April 2008. The reservoir is understood to fill each year. The catchment area is made up of steep wooded slopes near the dam, with non-vegetated mountainous slopes in the distance. The village of Leminot is located downstream of the dam.

The Leminot I&D infrastructure is one of the better schemes in terms of condition and this is probably because approximately 5km of the right branch main canal and 0.5 km of the left branch main canal were

rehabilitated in 2010. However, for the rest of the main canal on both the right branch and left branch, significant rehabilitation is required to enable the scheme to function as designed. Therefore the condition of the un-rehabilitated downstream irrigation infrastructure imposes a partial constraint on the original, current and future use of part of the scheme. Around 250ha are currently irrigated from the original design of 400ha all by gravity

The condition of the Leminot dam is considered to be fair and does not currently constrain the supply of water to the I&D scheme. A total of 7km of main irrigation channel on the right branch and 1.5km on the left branch is planned to be rehabilitated.

Figure 5-6 Aerial View of Leminot Reservoir

Koshnica reservoir

Koshnica 1 Reservoir in Korça prefecture is located about 12.3 km south of the town of Bilisht. Just downstream of the dam there has been a pumping station lifting the water for irrigation of the uphill slopes. The reservoir impounds its direct catchment (80%) and was fed by a feeder canal 20%. For the last 20 years the feeder canal has been out of use. A large slip on the downstream face of the dam is the main reason the reservoir has not filled in the last 12 years. The catchment area is made up of steep wooded slopes near the dam, with non-vegetated mountainous slopes in the distance. The area immediately downstream of the dam is farmland. The valley continues as a flat wide section with a width of 50 to 100 m for a several kilometres. Further on the water flows into Devolli River.

The original I&D scheme was only part implemented because the dam had problems during the construction. Only parts of the partially constructed canals were ever lined. Furthermore the rehabilitation of the feeder canal is crucial to ensure the reliability of water supply from the reservoir. Nevertheless, even with the feeder canal, and with proper operation of the reservoir it is questionable whether the reservoir will be full prior to the onset of the irrigation season, but this was based upon a limited rainfall data analysis.
The downstream irrigation infrastructure is in a very poor condition and given that the dam has failed and has not filled in the last 12 years this scheme needs the reconstruction of the Koshnica dam to be consid-

ered possible to move forward. All parts of the entire downstream irrigation infrastructure are in need of rehabilitation. Hence the current condition of both the failed dam and the downstream irrigation infrastructure impose a significant constraint on the original, current and future use of the scheme. Currently no land is irrigated at this site from an original design that had 850ha under irrigation (350ha by gravity and 500ha pumped). A total of 22km of main irrigation channel by gravity is planned to be rehabilitated.

Figure 5-7 Aerial View of Koshnica 1 Reservoir

Data on Group 3 reservoirs and I&D schemes

There follows information on the Group 3 reservoirs and I&D schemes which has mainly been taken from the TOR, and FS from Mott MacDonald. This is shown in Table 5-5 below.

Table 5-5: Tabulated data on Group 3 reservoirs and I&D schemes

Name of Site	Staravecke	Strum/ Kurjan	Slanica	Duhanas	Belesova	Murriz Thana	Zharrez
Date constructed	1974	1963	1976	1982	1977	1962	1970
Dam length (metres)	170	540 (700)	250	NA	304	3,570	522
Dam height (metres)	30	17	32	39	42	17	22
Capacity at TWL Mm^3	0.15	31,5	0.80	1.90	3.10	66.00	1.90
Surface area at TWL (ha)	4	355	8	16	25	850	35
Design irrigated area (ha)	60	5,430	230	1,280	912 (300 actual)	29,300	600
Road access to site	poor	good	good	good	good	good	poor
Surrounding geology	NA	Sandstone/ mudstone	Sandstone/ mudstone	Sandstone/ mudstone	Sandstone/ mudstone	Sandstone/ mudstone	mudstone
From geological map	NA	Rogozhina suite	Flysch	Flysch	Flysch	alluvium	silts
Reservoir Catchment area (ha)	NA	1,360	306	17,000	2,150	3,830	3,560
People considered at risk	50	350	75	420	200	210	390
Protected areas downstream?	No	No	No	No	No	No	No
Cultural/archaeological site downstream	No	No	No	No	No	No	No

Staravecke

Staravecke Reservoir (see Figure 5-8) is located about 14.2 km southeast of the town of Skrapare. The Staravecke reservoir is located at Poto Commune of Skrapare. The reservoir impounds its direct catchment (60%) and has a feeder canal (40%). It is understood to fill every year if the feeder canal is in use. Currently the feeder canal is thought to be out of use. The area immediately downstream of the dam is pasture. There is no valley downstream, so the water will be flow on the slope of the mountain for some 1 km passing through some 10 houses, before it reaches the stream in the valley.

Figure 5-8 Aerial View of Staravecke Reservoir

The Staravecke reservoir solely supplies the downstream irrigation infrastructure during the irrigation period. There was once a 1km feeder canal which is now completely dysfunctional that originally flowed into this reservoir. Based on the FS analysis, this feeder canal is essential for ensuring the reliability of the yield for the I&D scheme.

Other than the irrigation pipe immediately downstream of the outlet, which was rehabilitated in 2010 and is considered to be in good condition the remaining downstream irrigation infrastructure has not been rehabilitated since it was constructed, and has not been adequately maintained for several decades. It is estimated that only up to 30% of the reservoir yield can be taken for irrigation through the canal system. All parts of the entire downstream irrigation infrastructure are in need of rehabilitation. The current condition of the downstream irrigation infrastructure imposes a partial constraint on the original, current and future use of the scheme.

The current condition of the dam is in a poor condition, and the feeder canal does not function and this therefore constrains the reservoir yield and the supply of water downstream. Nevertheless due to the deep-seated historical slip under the reservoir it may not be safe to rehabilitate the feeder canal and fill the reservoir, and a failure of the dam would therefore significantly constrain the original, current and future use of the scheme.

Currently around 20ha of land is irrigated at this site from an original design that had 80ha under irrigation all by gravity). A total of 2.5km of main irrigation channel by gravity is planned to be rehabilitated.

Strum/Kurjan

Kurjan and Strum Reservoir (see Figure 5-9) in Fier Prefecture is located about 15 km east of the town of Fier. The reservoir is located at Kurjan Commune. Commune has about 228 ha of forests. Strum commune has about 30 ha of forests.. Trees that grow in these forests are mainly pine, willow, and, shrubs, etc. The most widespread wild animals are fox, rabbit, and also various birds like grouse, ouzel etc. Based on reports from Fier Drainage Board the actual capacity of this reservoir is some 25.5 million m^3 of water (less than the design estimate). The reservoir impounds its direct catchment (contributes 20%) and has a feeding canal (contributes 80%) collecting the water from next valley through the Cerven diversion dam. It is understood to fill every year, but for the last few years the reservoir has been partially filled because of the lack of maintenance of the channel between Cerven dam and Kurjan reservoir, and because of the lack of maintenance of the irrigation network downstream of the dam. The catchment area is made up of moderately steep wooded slopes near the dam, with some non-vegetated mountainous slopes in the distance. The area immediately downstream of the dam is farmland amounting to some 10 ha. In the valley within 500m of the toe of the dam there is a village and further on there are also several houses near to the downstream main stream, however the land is relatively flat.

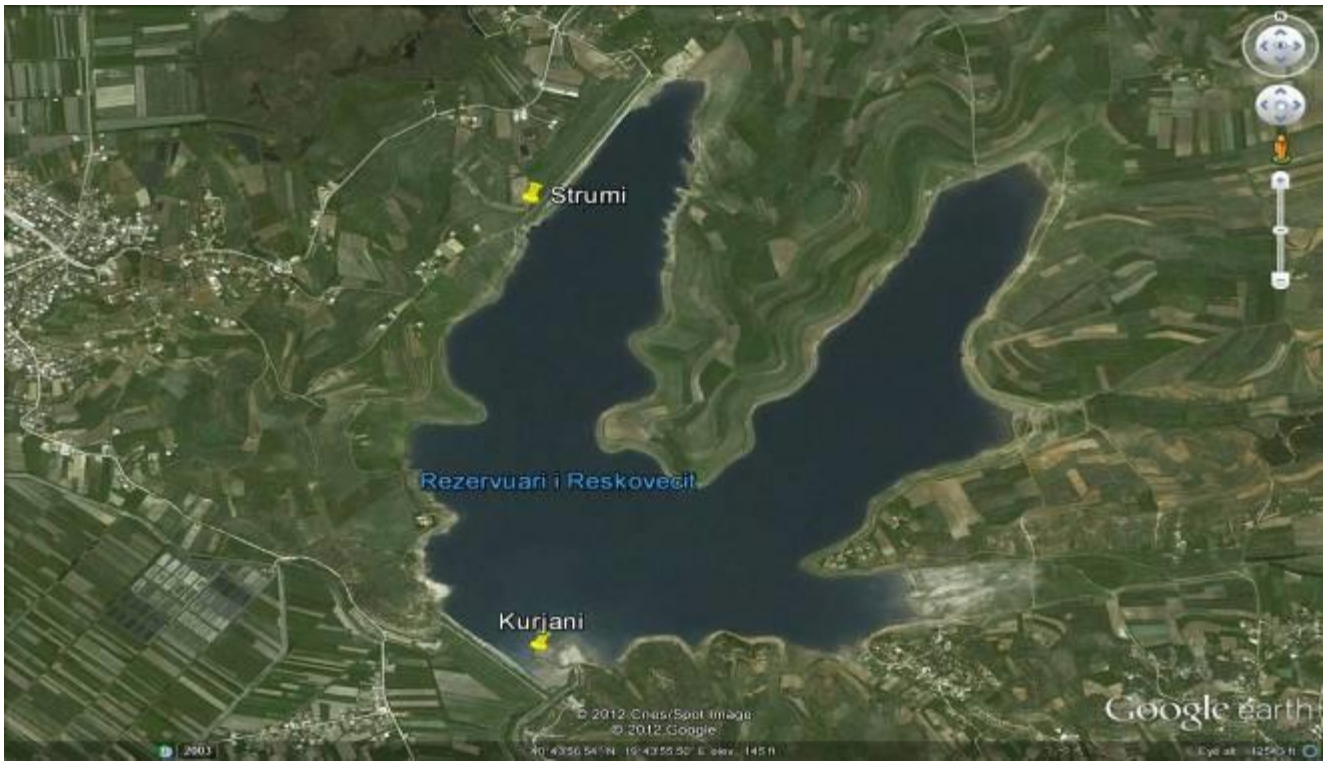


Figure 5-9 Aerial View of Strum and Kurjan Reservoir

The Strum and Kurjan reservoir solely supplies the downstream irrigation infrastructure during the irrigation period. The There is a large feeder canal which comes from Cerven Dam. In addition to this, the original design included a pumping station which assisted with the filling of the reservoir; this has not functioned for many years.

The feeder canal from Cerven reservoir feeds Kurjan reservoir and is vital to the reliability of the reservoir for supply of water to the existing irrigation system in its present condition. The original design included a pump station at Gorican which pumped water from the Seman River to a canal which then fed Matke pump station which pumped water into Kurjan reservoir. Since these do not operate currently the reliability of the reservoir yield is severely limited such that the original design irrigation area could not be adequately supplied with water.

Approximately 60% of the downstream irrigation and drainage infrastructure was rehabilitated in 1998-2006 and hence the remaining 40% of the mains and secondary irrigation channels are in need of rehabilitation. The parts which have not been rehabilitated have not been adequately maintained, such that the channel lining is significantly damaged or missing in a number of areas and there are areas of significant blockage due to silt and vegetation.

The current condition of the downstream irrigation infrastructure and the lack of the pumped feeder which is crucial in ensuring the reliability of the design reservoir yield impose a significant constraint on the original, current and future use of the scheme. It is estimated that 2,100 ha are currently irrigated from the reservoir from a design area of 5,430ha (4,730ha of gravity fed and 700ha of pumped irrigation).

The instability of Strum dam is of concern and although the current condition does not impose a restriction on the downstream supply, if works are not carried out and further movement is exhibited then this could lead to the reservoir being held down on safety grounds which has necessary impacts on the I&D system.

A significant amount of rehabilitation works are proposed at this site including 14.2km of main channel and 26km of secondary channel on Section VMK1 and 13.6km of main channel and 59km of secondary channel on VMK2 together with rehabilitation on 2 pump stations

<u>Slanica</u>
Slanica Reservoir is located in the Berat prefecture, about 14 km west of the town of Berat. The reservoir actually impounds its direct catchment only and is understood to fill every year. Access to the dam is via surfaced rural roads for the most part. The catchment area is made up of vegetated hills.

Figure 5-10 Aerial View of Slanica Reservoir

The Slanica reservoir solely supplies the downstream irrigation infrastructure during the irrigation period and is supplied by direct catchment only (there are no feeder canals). There are two branches of main canal totalling 11.2 km in length. Only 3.5 km of the right branch has been rehabilitated since original con-

struction. Part of this canal crosses the dam berm with a retaining wall on the dam slope. The main canal is in very poor condition and the discharge of the canal is limited by the condition, and there is substantial leakage. It is estimated that up to 50% of the reservoir can be conveyed through the canal system. The pumping station which has been destroyed, that originally took water from the existing siphon fed by the right branch. All parts of the entire downstream irrigation infrastructure are in need of rehabilitation and this currently imposes a partial constraint on the existing, original and future scheme. This scheme was originally designed for 320 ha, (300ha gravity and 20ha pumped.

The Slanica dam is in relatively fair condition and the accumulation of silt is small, however given the downstream water supply needs, siltation will remain a problem. It is likely to require the raising of the upstream outlet chamber every several years until the lower levels of the reservoir are silted. The reservoir therefore imposes a partial constraint on the original, current and future use of the scheme. A total of 7.1km of main channel on the right branch and 0.7km of main channel on the left branch are in need of rehabilitation on this scheme.

Duhanas

Duhanas Reservoir (see Figure 5-11) is located in Berat prefecture about 6 km north-east of the town of Berat. The Duhanas is situated in Velabisht Commune that has about 1800 ha of forests. These forests are dominated by alpine pastures and shrubs. Some of wild animals are rabbit, fox, grouse etc. It is believed that the reservoir is filled entirely by its direct catchment. The direct catchment area of the reservoir is steep and mountainous. The dam is in a steep sided valley about 5 km upstream of the town of Berat. There are perhaps 25 houses at risk in the valley prior to reaching Berat but the failure of the dam would probably destroy many more houses when account is taken of the likely damage in the town of Berat.

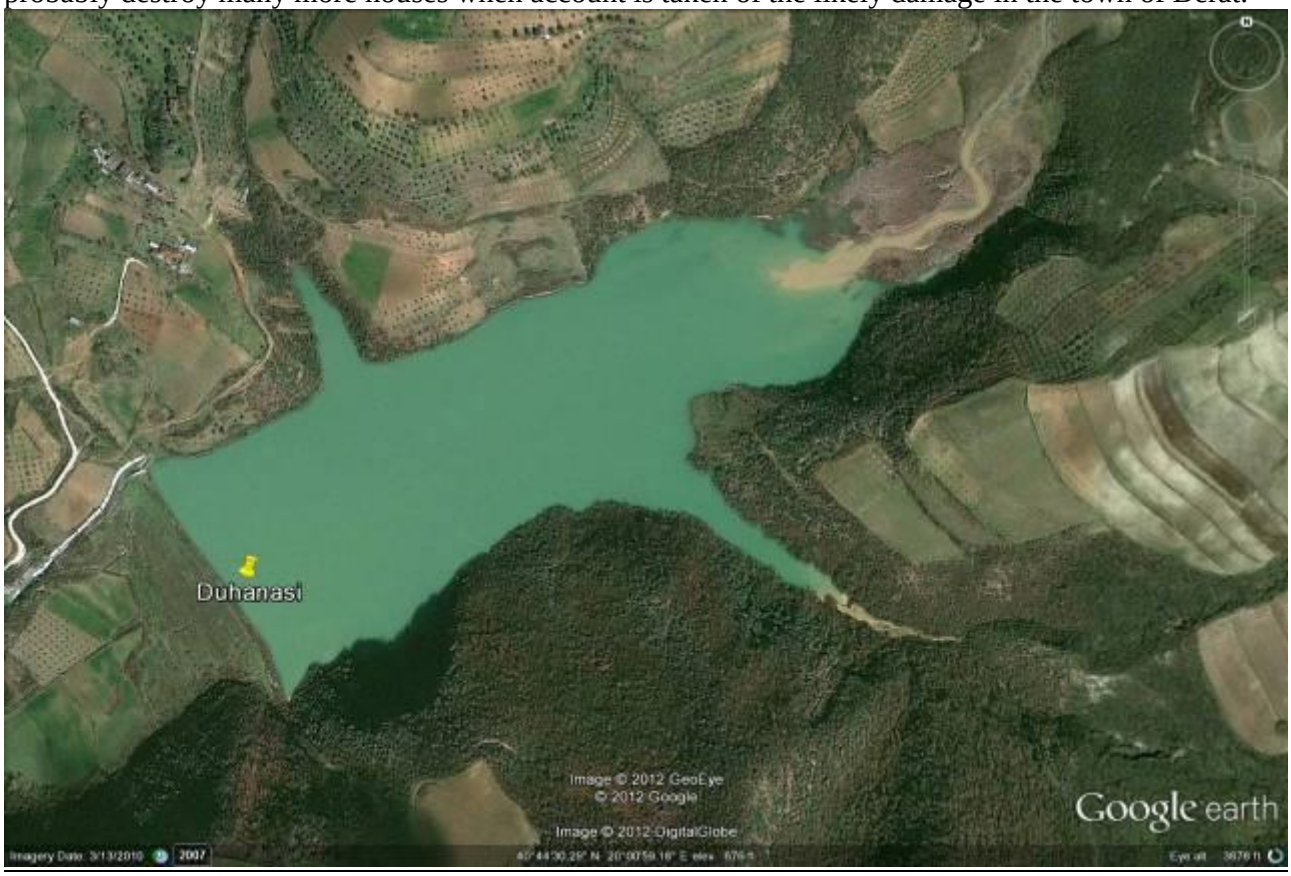


Figure 5-11 Aerial View of Duhanas Reservoir

The reservoir solely supplies the downstream irrigation infrastructure during the irrigation period and there is no feeder canal for this reservoir. The downstream irrigation infrastructure has not been rehabili-

tated since it was constructed, and has not been adequately maintained for several decades. Due to the failure in the downstream siphon, approximately 600m downstream of the dam, the main canal does not function, and it is estimated that only 15 – 20% of the water which would have been used in the original design, can now be used.

This irrigation water is taken via the stream bed and irrigation occurs by gravity. All parts of the entire downstream irrigation infrastructure are in need of rehabilitation. The current condition of the downstream irrigation infrastructure imposes a significant constraint on the original, current and future use of the scheme. It is estimated that only 50ha are currently irrigated by gravity on this scheme from an original design of 550ha (280ha by gravity and 270ha by pumping).

The Duhanas dam has some problems in some areas. The downstream outlet chamber and valve and the canal immediately downstream of the bottom outlet valve are all in need of rehabilitation and they currently leak significantly. The reduction in live storage capacity due to the inflow of silt is of concern for the continued supply of water since it could block the upstream bottom outlet chamber such that the outlet can not be operated. It is estimated that within 30 years the current live storage capacity will be halved, assuming the upstream bottom outlet chamber is raised several times. The condition of the dam does therefore impose a partial constraint on the original, current and future use of the scheme. Around 18.5km of main irrigation channel by gravity are planned to be rehabilitation on this scheme.

Belesova

Belesova Reservoir (see Figure 5-12) is located in Berat prefecture about 15 km north east of the town of Berat. Belesova Commune has about 3520 ha of forests. These forests are dominated by alpine pastures and shrubs. Some of wild animals are rabbit, fox, grouse etc.. It is believed that the reservoir is filled entirely by its direct catchment. The reservoir is understood to fill on a regular basis. No design or construction drawings were made available at the time of the inspection and therefore only visual observations are reported here. Middle Oligocene formation of weak marine sedimentary deposits of Flysch containing inter-bedded clay, sand and conglomerate layers. The catchment area is made up of steep wooded slopes near the dam, with non-vegetated mountainous slopes in the distance.

The reservoir solely supplies the downstream irrigation infrastructure during the irrigation period and there is no feeder canal for this reservoir. The downstream irrigation infrastructure has not been rehabilitated since it was constructed, and has not been adequately maintained for several decades. The main canal is now no longer in operation and all water used for irrigation is taken from the adjacent stream. All part of the downstream irrigation system are in need of rehabilitation. The current condition of the downstream irrigation infrastructure imposes a significant constraint on the original, current and future use of the scheme. It is estimated that only 50ha are currently irrigated by gravity on this scheme from an original design of 1,280ha (1,150ha by gravity and 130ha by pumping).

There is a significant concern due to leakage along the new siphon pipe which could cause wash out failure and therefore the reliability of yield is at risk due to possible failure of the dam. The reduction in live storage capacity due to the inflow of silt is of concern for the continued supply of water since it could block the upstream bottom outlet chamber such that the outlet may not operate. Even if the upstream bottom outlet chamber is raised several times, the reservoir yield will decrease over time, and it is estimated that within 15 years the current live storage capacity will be halved, and within 30 years nearly all of the storage area will have been filled with silt. Hence, the current condition of the dam does therefore impose a partial constraint on the original, current and future use of the scheme. However, should dam failure occur, this would pose significant constraint on the scheme. Around 11.8km of main irrigation channel by gravity are planned to be rehabilitation on this scheme.

Figure 5-12 Aerial View of Belesova Reservoir

Murriz Thana

Murriz Thana Reservoir (see Figure 5-13) is located in the Fier prefecture about 15.5 km South-East of the town of Lushnje and is the largest reservoir of the 14 sites to be reviewed. The reservoir impounds its direct catchment (approximate inflow contribution = 20%) and a feeder canal (approximate inflow contribution = 80%). The feeder canal transfers water from the Devolli River via a diversion adjacent to the Vlashuk village. The catchment area is made up of flat hilly slopes. The catchment area (known as the Belshi Lakes) consists of many natural lakes which have formed due to the karst topography of this area. The area immediately downstream of the dam is farmland and populated. The river runs along the toe of the dam. Some two houses are just downstream the dam and more are some 1 km further downstream.

The reservoir solely supplies the downstream irrigation infrastructure during the irrigation period. In the last 50 years it has always filled successfully, normally with filling commencing at the start of April.

It is understood that a concession has been let on the Devolli river for 3 hydropower reservoirs, and it is highly likely these will be constructed and in-operation by 2019. The off take for Murriz Thane is downstream of Banja reservoir which is the last reservoir in the hydropower scheme. Banja dam was partly constructed during the late 1980s. There should therefore be adequate reliable flow in the Devolli River at the off take, such that the feeder canal can feed Murriz Thana reservoir all year round.

However, it should be noted that since construction, significant siltation of the reservoir has taken place. The Irrigation and Drainage board reports that 12 million m^3 of water volume has been lost due to this and hence siltation should be seen as a threat to the ability of the reservoir to supply water to the downstream irrigation scheme. It should also be noted that the use of the reservoir for hydropower will lead to the reservoir being held full all year round and this will increase the silt accumulation rate. The authorities should consider minimising the accumulation of silt through further study such as the provision of a settlement basin upstream. The I&D schemes comprises four main branches; Çukas, Krutja Lushnje and Terbuf

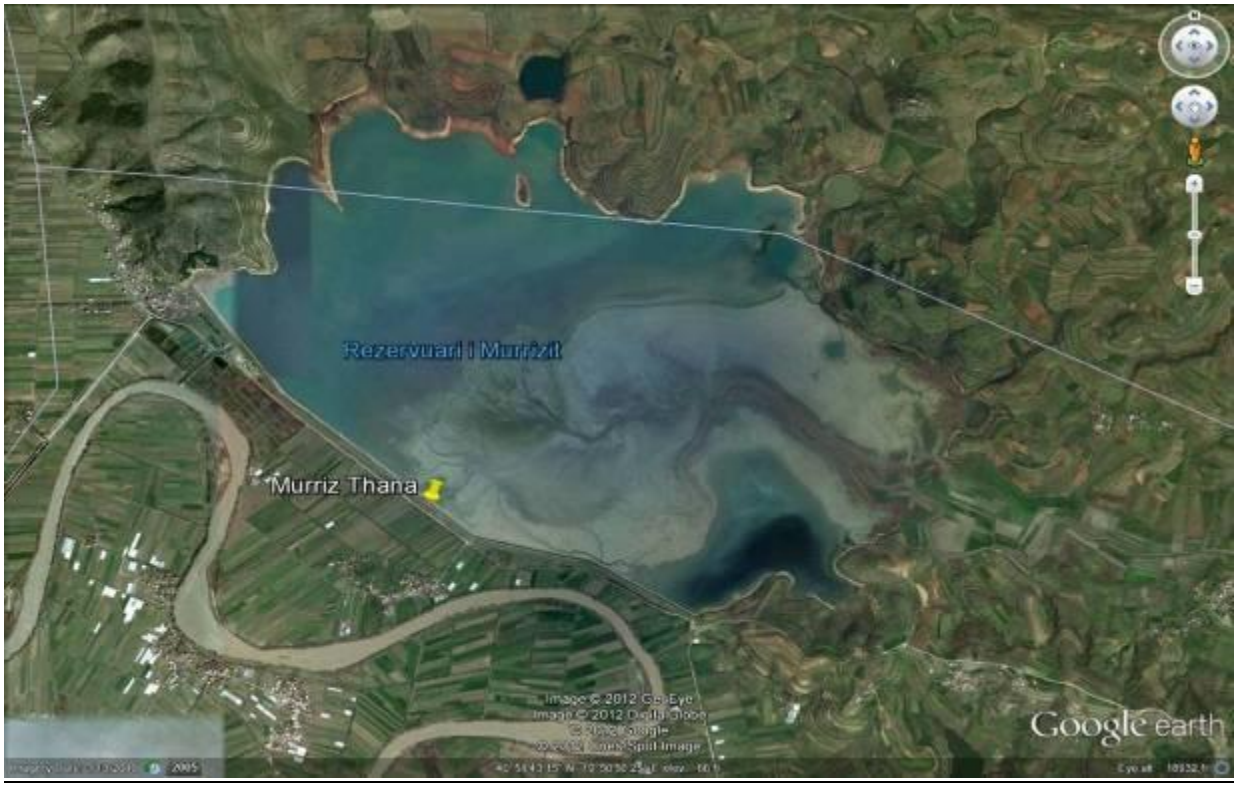


Figure 5-13 Aerial View of Murriz Thana Reservoir

Çukas branch canal irrigates in total 8,600 ha: 5,600 ha in the Lushnje Irrigation area and 3,000 ha in the Fier Irrigation area. Its total length is 32 km and it supplies water to 46 km of secondary channels. The branch is unlined and some structures were rehabilitated between 1995 and 2005. The first 10 km are in cut, below the level of the surrounding fields, and the remaining 22 km is mostly raised. It is proposed in the rehabilitation options that the conveyance system within the 22 km section is rehabilitated such that approximately 50% of the canal is lined to reduce seepage losses and increase the reliability of water to the tail of the canal which has suffered a shortage of irrigation water since the original construction of the scheme in the 1960s.

Krutja Branch was originally 23.4 km long and irrigated 6,900 ha in Lushnje district. During the 1980s the Branch was extended twice (bifurcating at the tail), the first (V2) by 9.2km to irrigate a further 1300ha in Lushnje irrigation area, the second by approximately 6km (V1) to irrigate 1,000ha which belongs to Fier irrigation area. Krutja Branch was originally designed only for the 6,900ha, and therefore, at peak times there is not sufficient water to irrigate land associated with the extensions. Bitaj pumping station pumps water during the peak season from the main drain (Bitaj collector) back into Krutja branch at the point of bifurcation. This pumping station still functions although the immediate associated canals and the pumping station are in need of rehabilitation. Only 20% of the rehabilitation of the canals and structures on the main and secondary canals was undertaken in 1995 – 2005. The Krutja branch is a raised canal and in need of lining which is proposed in all rehabilitation options. The scheme area supplied by this branch is part of the most important agricultural land in Albania and it is therefore proposed that the canals are lined to reduce the losses and that automatic regulation of the water level and off takes with automatic duckbill cross regulators is implemented. This should ensure the provision of more than $8m^3/s$ (the original design capacity) in the branch and increase the reliability of water supply at the tail to assist at the peak times with supply in V2. This will reduce the reliance on the pumping station.

Lushnje Branch, which is 18.2km long to Lushnje town, irrigates 7100 ha from which 1200 ha are pumped. The branch canal irrigates 1500 ha directly. Immediately downstream of Lushnje town the

branch canal divides into two main branches, V3 (5.1km) and V4 (16.7km) where the remaining hectares are irrigated. Lushnje branch is a contour canal and has problems with silt and stability. There are also 60km of secondary channels. There were once 3 small pumping stations along Lushnje branch and V4 which irrigated the hillside (approximately 600ha), however these stopped functioning many decades ago. At the tail end of V4 there is 600ha of irrigation by sprinkler (Terbuf), however this sprinkler irrigation system is completely dysfunctional and the pipes have been removed.

Terbuf Branch which irrigates 4,400ha and starts approximately 6km south of Lushnje, takes water from the main drain, K1, however this drain is supplied directly by the reservoir approximately 1km downstream of the dam. The Terbuf branch main canal is divided into V1 and V2. 150ha are irrigated from the main canal, 4350 ha are irrigated from the V1 and V2 main canals. The tail end of V1 has a sprinkler irrigation section of approximately 500 ha which is called Grabiani, and is now completely dysfunctional and the pipes have been removed. This sprinkler irrigation section was designed to be supplied by V1 but never functioned as designed, however, in the few years that it was in function they reused the water from the drainage network. Terbuf V1 and V2 where rehabilitated in circa 2000 as was Grabiani. Grabiani is once again dysfunctional and approximate 30% of V1 and V2 now require rehabilitation.

The current condition of the downstream irrigation infrastructure imposes a constraint on the original design, current and future use of the scheme. The current condition of the reservoir has been held down 2m below TWL due to an upstream slip, hence the dam also imposes a constraint on the original design, current and future use of the scheme. Around 15,000 ha are currently irrigated from Murriz Thana reservoir from an original design 29,300ha (27,600 gravity and 1,700ha pumped).

In terms of rehabilitation, 32km of main canal and 46kms of secondary canal are planned at Çukas Branch; 23.4km and 9.2km (V2 only) of mains and 32kms of secondary canals at Krutja Branch; 40km of main canals and 82kms of secondary canals at Lushnje Branch; and 30.1kms (including V1 andV2) of main canal and 40.5kms of secondary canals at Terbuf Branch.

Zharrez

Zharrez Reservoir (see Figure 5-14) in the prefecture of Fier is located about 9.8 km east of the town of Fier. The reservoir impounds its direct catchment only and is understood to fill every year. During the visit the reservoir was full and the spillway was spilling some 1 - 2 m3/s. The catchment area is made up of steep wooded slopes near the dam, with non-vegetated mountainous slopes in the distance. The area immediately downstream of the dam is farmland. The valley continues as a U-section with a width of 50 to 100 m for around 1 km. Further on, the stream produced from the spillway flows into the main drain

The Zharrez reservoir solely supplies the downstream irrigation infrastructure during the irrigation period and is filled by direct catchment only. In the original design of the I&D scheme there were two branches, with14.6 km of main canals in total and 9 km of secondary canals in total which were built to irrigate the project area of 600 ha. Currently it is estimated that only 300 ha are now irrigated and this is because of the recent rehabilitation undertaken approximately 4 years ago, when 60% of the canal network was repaired. This part of the system still remains in good condition, however the tail end of both the right and left branches of the scheme need rehabilitation (they are not currently lined and no structures have been rehabilitated). The current condition of the irrigation infrastructure imposes a partial constraint on current, original and future scheme.

The condition of the dam and reservoir presents a few concerns. The reduction in live storage capacity due to the inflow of silt is of concern for the continued supply of water since it could block the upstream bottom outlet chamber such that the outlet cannot be operated, it will therefore need to be raised every few years. Given the rate of siltation it is estimated that the current live storage capacity will be halved within 12 years and within 25 years the entire storage capacity will be full with silt. The reservoir there-

fore imposes a partial constraint on the original, current and future use of the scheme. A total of 9.5km of main canal and 4kms of secondary canal and 5.1kms and 5kms of secondary canals on the left branch are planned to be rehabilitated.

Figure 5-14 Aerial View of Zharrez Reservoir

5.3.4 Condition of Dams and Reservoirs

The Feasibility Study by Mott MacDonald provides a synopsis of the current condition of the dams and I&D schemes under review. Whilst the I&D rehabilitation has been mentioned in the previous section, the condition of the dams and reservoirs are summarised in Table 5-6 below. Essentially all dams require some rehabilitation work; some more than others. For example, Koshnica 1 needs to have the dam re-build due to a historic slip, Murriz Thana, Staravecke and T'Plan all have some stability issues than need to be addressed. A geotechnical survey is planned to be undertaken at all 14 sites during the detailed design stage which will take place during the first year of the WRIP (indicated as Phase 2 in the Mott MacDonald Study). Siltation is a significant concern at Belesova and Zharrez.

5.3.5 Dam Rehabilitation Works Proposed

The Feasibility Study by Mott MacDonald provides details of the main rehabilitation works to be undertaken at the dams under review. This is summarised in Table 5-7 below. The full extent of the works however will not be known until after the detailed design. An important issue however is that four sites are intended to have their crest raised by between 0.3 and 0.5 metres (Zharrez, Slanica, Belesova and Duhanas). This will increase the reservoir area at TWL and may impact slightly on shorelines surrounding the mentioned reservoirs. Exact details of the extent of the flooded area at TWL are not known at this stage, but will become apparent during the detailed design. However, the Consultant has ascertained that these reservoirs are surrounded by state owned land and will not impact on private properties.

In the case of Duhanas the proposed option from the FS includes installing a spillway with a sill set 0.5m above current sill level to increase the storage capacity of the dam. This will also imply installation of a new wave wall. This increase in crest level is on the spillway and therefore does not impact upon the dam width which remains unchanged. It is considered that this increase in live storage capacity will also benefit downstream users.

In the case of Belesova the proposed option from the FS includes reconstructing the spillway with a sill set 0.3m above current sill level to increase the storage capacity of the dam and two sill traps constructed on the main streams in the catchment area. The increase in the silt level is on the spillway and therefore does not impact upon the dam width which remains unchanged. It is considered that this increase in live storage capacity will also benefit downstream users and also the operational times of the hydropower installation on this dam. However the HPP concessionaire will need to abide by the operating rules that will be established in consultation with other parties and facilitated by the river basin agency.

In the case of Zharrez the proposed option from the FS includes enlarging the spillway weir set 0.5m above current spillway level to increase the storage capacity of the dam and a parapet wall. This increase in sill level is on the spillway and therefore does not impact upon the dam width which remains unchanged. It is considered that this increase in live storage capacity will benefit downstream users.

In the case of Slanica the proposed option from the FS includes modifying the spillway sill level to be 0.5m above current spillway level to increase the storage capacity of the dam. This also necessitates an enlarged length of sill and a parapet wall to ensure free board requirements are met. This increase in sill level is on the spillway and therefore does not impact upon the dam width which remains unchanged. It is considered that this increase in live storage capacity will also benefit downstream users.

Further details on these specific dams and the effects on any land take regarding the increase TWL are discussed in the individual site specific ESMPs. The ESIA Consultant has also checked the dams in terms of OP 4.37 Safety of Dams. The OP 4.37 will of course be triggered and will require due diligence to ensure that dam safety measures are in place. All dams are pre-existing and hence fall under paragraphs 7-11 inclusive of OP 4.37 (existing dams and dams under construction). With the exception of Tregtan 2 (10 metres in height) all the can be classified as large dams as they are more than 15 metres in height. In the case of Koshnica 1 this may need complete reconstruction so this could fall under paragraph 2-6 of OP 4.37.

Table 5-6: Details on the current condition of dams and reservoirs

#	Dam	Main Problem and issues	Feeder canal in function	Freeboard capacity Adequate	Stability Problems	Keep water level low until after works complete	Siltation	Downstream Flooding Risk
1	Murriz Thana Dam	• Recent slip on upstream face • Slips on downstream face • Erosion problems downstream	Yes	Spillway needed	Yes	Yes (kept down)	Some concern	Negligible effect. At present kept -2m below TWL. Mini HPP planned. Likely reservoir to be held at TWL all year round once works completed.
2	Kurjan Dam	• Fair condition • Crest needs to be levelled	Yes but pump u/s	Marginally inadequate	None apparent	No	Limited concern	Negligible effect.
3	Strum Dam	• Old slip downstream face • Irregularity upstream face	As Kurjan	As Kurjan New spillway	Needs geotechnical survey	No	As Kurjan	Negligible effect although new spillway will make flooding marginally worse.
4	Leminot Dam	• Areas of seepage downstream • Outlet works need rehabilitation	Not applicable	Marginally inadequate	Needs geotechnical survey	No	Limited concern	Small. Works do not include increasing capacity of reservoir.
5	Duhanas Dam	• Crest shows historic overtopping • Some areas of seepage downstream	Not applicable	Inadequate	Needs geotechnical survey	Yes	Some concern	Negligible effect although works to spillway will make flooding marginally worse.
6	Belesova Dam	• Seepage along new outlet pipe • Collapse features • Significant risk of washout failure	Not applicable	Inadequate	Needs geotechnical survey	Yes	Significant concern	Negligible effect. Mini HPP planned. Likely reservoir to be held at TWL all year round once works completed.
7	Tregtan 2 Dam	• Crest and downstream side needs re-profiling • Significant wave damage • Outlet works in poor condition • Spillway is broken	Not applicable	Inadequate, rebuild spillway	Needs geotechnical survey	Yes	Limited concern	Small catchment, negligible risk.
8	Tregtan 3 Dam	• Spillway broken • Deep erosion gullies on downstream • Outlet works are poor with significant seepage	No	Inadequate, rebuild spillway	Needs geotechnical survey	Yes	Limited concern	Small catchment, negligible risk.
9	Vranisht 2 Dam	• Downstream side very wet and steep • Significant profiling necessary • Outlet works in poor condition	Not applicable	Inadequate, modify spillway	Needs geotechnical survey	Yes	Limited concern	Small catchment, but changes to spillway could make flooding marginally worse.
10	Koshnica 1 Dam	• Dam has failed and needs to be rebuilt	No	Inadequate, dam failed	Yes	Yes	Limited concern	Small catchment, reservoir cannot be filled until works complete. Marginal risk of downstream flood risk once operational.

#	Dam	Main Problem and issues	Feeder canal in function	Freeboard capacity Adequate	Stability Problems	Keep water level low until after works complete	Siltation	Downstream Flooding Risk
11	Staravecke Dam	• Low spot on dam crest • Dam believed to be on deep historic slip	No	No	Yes	Yes	Limited concern	Very small effect. Likely reservoir to be held at TWL all year round once works completed. Increasing spillway capacity could make downstream flooding marginally worse.
12	T'Plan Dam	• Downstream outlet pipe thought to be cracked inside the dam • Causing significant instability, including slip • Not safe to hold water	No	Inadequate, rebuild spillway	Yes	Yes (kept down)	Limited concern	Catchment very small, reservoir cannot be filled at present. But after works there is a marginal increase in flood risk downstream.
13	Zharrez Dam	• Some problems with seepage • Some erosion problems	Not Applicable	Marginally inadequate	Needs geotechnical survey	No	Significant concern	Moderate catchment, increasing spillway capacity could make downstream flooding marginally worse
14	Slanica	• Some seepage on left mitre • Dam crest bare in some places.	Not applicable	Marginally inadequate	Needs geotechnical survey	No	Some concern	Negligible effect and has a small catchment. Slight increase in spillway capacity.

Source: Adapted from Mott MacDonald Feasibility Study

Group 1 Dams
Group 2 Dams
Group 3 Dams

Table 5-7: Details on the main rehabilitation works proposed on dams and reservoirs

#	Dam	Potential Main Remedial Measures Necessary						Comments
		Downstream berm	Upstream berm	Toe Drain	Downstream surface drainage	Surface Re-profiling	Raise/Reduce Dam height	
1	Murriz Thana Dam	Yes			Yes	Yes		Excessive leakage and wash out failures
2	Kurjan Dam							No significant issues
3	Strum Dam		Yes			Yes		Creep on upstream face, stability analysis to be done at detailed design
4	Leminot Dam	Yes		Yes		Yes		
5	Duhanas Dam			Yes			Raise spillway sill 0.5m	Toe drain needed to pick up seepage
6	Belesova Dam	Yes				Yes	Raise spillway sill 0.3m	Possible addition of berm depends on geotechnical survey (detailed design)
7	Tregtan 2 Dam					Yes		Possible addition of berm depends on geotechnical survey (detailed design)
8	Tregtan 3 Dam				Yes	Yes		If geotechnical investigation prove unacceptable slope stability toe berm is preferred option
9	Vranisht 2 Dam	Yes		Yes		Yes		
10	Koshnica 1 Dam	Yes		Yes		Yes	Reduce	Significant works required due to existing slip plane.
11	Staravecke Dam	Yes		Yes			Reduce 0.6m	Previous slip plane underlying dam.
12	T'Plan Dam	Yes				Yes		Possible addition of berm depends on geotechnical survey (detailed design)
13	Zharrëz Dam	Yes		Yes		Yes	Raise spillway weir 0.5m	
14	Slanica Dam	Yes				Yes	Raise spillway sill 0.5m	Possible addition of berm depends on geotechnical survey (detailed design

Source: Adapted from Mott MacDonald Feasibility Study

Group 1 Dams
Group 2 Dams
Group 3 Dams

6 BASELINE DATA

This chapter uses data on the physical-biological and human environments (the latter primarily focussing on socio-economics). The data collected are from existing sources of information, such as "the Hydro-meteorological Atlas", the "Physical Geography of Albania" (Edition of Albanian Academy of Sciences), INSTAT ALBANIA, data from the year 2010 and statistical offices of the relevant Communes, the Mott MacDonald FS which covers the reservoirs that require rehabilitation; and field surveys undertaken for verification purposes of some data and for additional information when data gaps are identified.

6.1 Location and General Description

Albania is a European country within Europe, situated in the West of the Balkans. The Country is bordered from the west from the Adriatic Sea and the Ionian Sea which are both parts of the larger Mediterranean Sea. The country has a variable terrain, constituted by high mountain areas in the north, east and south, and a lowland plain that lies to the west. By its climate, relief, and other physical features the country is divided in four main regions, namely:

- The Central Mountain Region,
- Southern Mountain Region,
- Alps, (representing the northern part of Albania) and
- Adriatic Lowland in its West.

The Hilly areas (defined as Hilly central Region) are an intermediary zone between the Central Mountain Region and the pre-Adriatic Lowland. The pre-Adriatic lowlands, are also intermediary territories situated between hilly zones and the Albanian Adriatic coast (known as Adriatic Lowland).

Albania can also be divided into four agro-ecological zones, namely; Lowlands, Intermediate lands, Southern Highlands and the Northern & Central Mountains. These agro-ecological zones are classified by: climate; soils, geomorphology/relief and socio-economic features.

As mentioned in the previous chapter, the project consists on rehabilitation and revitalization of 14 dams and 13 agricultural reservoirs, located at Northern part of Central Mountain Region, Southern Part of Central Mountain Region, on Intermediary Zone of Adriatic pre-Lowland Region, on the Intermediary Zone of Hilly Central Region, and on the Intermediary zone between Hilly Central Region and Southern Mountain Region; hence there is a broad diversification of different characteristics between the sites.

The Physical Environment

The physical environments of the territories where the 14 dams, 13 reservoirs and associated I&D schemes are situated are divided into three sub groups that respect their geographical position. These three groups have quite different biological and-physical characteristics, but the reservoir environments and their surroundings in one group are quite similar. Key sources of information have been Academic Atlases (Hydro-meteorological Atlas), thematic maps, the Physical Geography of Albania, the Albanian Red Books, several scientific studies, and when gaps have been noted, the Consultant has organized field surveys to collect additional useful information. The FS from Mott MacDonald was also a very useful documentation source.

There follows details of the physical environment covering climate, geology, topography and geomorphology soils etc.

6.2 Climate

Albania has a Mediterranean Climate, categorized in several sub-climatic regions. A proportion of the reservoirs are situated in the Central Mountains zone of Albania, including those sites around Kukes/ Tropoja and Korça.

The others sites are located near to the settlements of Fier, Berat and Lushnje and are either within the Albanian Western Lowland zone (displaying different physical and biological characteristics) or on the border with the Central Mountains zone.

The climate is characterized by four seasons, summer, autumn, winter and spring. The other factors that influence the environmental characteristics of the different groups are geographical position, geomorphology, hydrology, etc.

Lowland Zones - The reservoirs of Kurjan, Strum, Zharrez and Murriz Thana, are part of districts of Fier and Lushnje that are part of the Lowland Zone of the southern coastal plain, and have a typical Mediterranean Climate with hot summer and mild wet winter. Those reservoirs are situated at the southern part of the Lowland zone (pre Adriatic Lowland). This climate region is generally thought suitable for growing cereals, vegetables, forages, citrus, olives, and fruit trees.

Intermediate Zone - The reservoirs of Slanica, Belesova and Duhanas, situated in Berat district, has a climate region not as wet as the other regions under the study, suitable for growing wheat, potatoes, sunflower, tobacco, vegetables, vineyards and fruit trees. This climate is conditioned from air springs coming from the Sea coast and entering till the hilly and mountain areas (running on the river valleys). Such climate is characterized by similar conditions like Southern Highland Zone, but with a hot summer and not so cold winter.

The Southern Highland Zones - The reservoirs of Koshnica and Leminot, in the Districts of Devolli are part of the Southern Highlands Zone. This zone has a moderate interior continental climate with cold winters and warm summers with lass rainfalls compares with other sites under the study.

The climate is similar to the Northern Highland Region, but the geographical position and the geomorphological condition vary. The influence of the continental climate is greater here than in other regions of Central Mountains Region of Albania. Ice and snow are natural phenomena that sometimes start in November and continue until April. Average annual precipitation is 600 to 1200mm/year, with significant amounts of snow received throughout winter months. Frost also impacts and constrains agricultural production. This area consists primarily of mountainous terrain, interspersed with productive agricultural valleys. This area is especially suitable for growing wheat, barley and rye; as well as vegetables, potatoes and fruits (apples, plums, pears etc.). In this zone forests and pastures dominate.

The North of Central Mountain Zone, where are situated the Tregtan2, Tregtan 3, Vranisht and T'Plan reservoirs, has a climate of the Mediterranean in nature due to the influence of the air streams coming through the river valleys from the Adriatic Sea to the inner mountain valleys and is formally classified as an Eastern Mediterranean Mountain Climate. November and December are the wettest months and July the driest. Given the high mountainous terrain, the majority of land is used for forest and pasture production, but significant areas are also used for forage crops, wheat, vegetables, potatoes, and fruit trees. Conversely, from the opposite direction, the Continental influence is very active in this sub-region overall during winter. Such differences are clearly shown by rises in the air temperatures. For example in Kukes, the mean temperature for April is 5˚C more than in March. The daily amplitude in the autumn and spring is around 10-15˚C with a maximum 21.5˚C. The wettest and coldest season is the winter, and the hottest and driest one is the summer, with the former being four times as wet as the summer.

Table 6-1 provides a summary of the general data on climate for the 14 dam and 13 reservoir and I&D schemes sites.

Table 6-1: General Data on Climate for Dam and Reservoir I&D Schemes Sites

#	Dam and Reservoir and I&D Scheme Name	Average Temp °C		Average Rainfall (mm)		Humidity (%)	Sun Hours	Frost Periods	Evapora-tion (mm/day)	Est. Avg. winter soil temp °C at 10cm depth
		Min Winter	Max Summer	Winter	Summer					
1	Murriz Thana Dam	8 to 10	26 to 30	365	77	55-60	2682	Jan-Feb	3.7- 6.3	6
2	Kurjan Dam	8 to 10	26 to 30	365	77	55-60	2792	Jan-Feb	3.7 – 6.3	6
3	Strumi Dam	8 to 10	26 to 30	365	77	55-60	2792	Jan-Feb	3.7 – 6.3	6
4	Leminoti Dam	-1 to -2	26	277	88	50-85	2423	Dec - Feb	2.7 – 5.1	1
5	Duhanas Dam	6 to 7	23 to 24	395	106	55-80	2792	Jan-Feb	3.1 – 5.92	6
6	Belesova Dam	6 to 7	23 to 24	415	113	55-80	2682	Jan-Feb	3.1 – 5.92	6
7	Tregtan 2 Dam	-10 to -15	25 to 26	272	112	45-65	2045	Dec – Feb	2.6 – 4.7	1
8	Tregtan 3 Dam	-10 to -15	25 to 26	272	112	45-65	2045	Dec – Feb	2.6 – 4.7	1
9	Vranisht 2 Dam	-10 to -15	24 to 25	272	112	45-65	2045	Dec - Feb	2.6 – 4.7	1
10	Koshnica 1 Dam	-10 to -15	24	277	88	55-65	2423	Dec - feb	2.5 – 4.7	1
11	Staravecke Dam	-5 to -6	22 to 23	395	106	55-65	2414	Jan-Feb	2.5 – 4.4	6
12	T'Plan Dam	-15 to -20	24	644	201	60-65	2045	Dec-Feb	2.6 – 4.8	1
13	Zharrez Dam	8 to 10	26 to 30	365	77	55-60	2792	Jan-Feb	3.7 – 5.9	6
14	Slanica	6 to 7	23 to 24	365	77	55-80	2792	Jan - Feb	3.1 – 5.92	6

Source: Mott MacDonald Feasibility Study

6.2.1 Rainfall

Lowland Zone where is situated the Zharrez, Kurjan, Strum and Murriz Thana reservoirs, has an average annual rainfall is 800-1200 mm, of which 70-75% falls during autumn and winter, while in the summer 5% -12% of annual precipitation falls. Generally July and August are dry months, with scarce rainfall that is not enough for plant growth and development. Irrigation to address the soil moisture deficit is therefore necessary during these months.

Intermediary Zones - Slanica, Belesova and Duhanas reservoirs, situated in Berat district, have an average annual rainfall of between 800 - 2500mm/year. The rainfall in winter is significant, and in the Berat area during the period from October to April, which is the period of wheat's development, on average approximately 90% of the annual precipitation falls, which makes it necessary for land drainage. In the months between May and September 12% of precipitation falls, with 7% falling during June- August.

South Highland Zone - Rainfall has a lower intensity and abundance in relation with other territories of the region (600-680mm/year). The wettest month is December and the coldest one the January. The daily maximum of rainfalls is 76mm. The wind has regional and local characteristics, conditioned mostly by the relief of the area.

Northern and Central Highland Zone - Average annual precipitation goes from 800 to 2500 mm/year. Precipitation is winter dominant and given the terrain the area is exposed to significant amounts of snowfall and frost days Precipitation is heavily dependent upon relief and maximum rainfall ranges from 75mm/day to 230mm/day. Average sub regional precipitation is around 1,500mm per year. Snow and ice occurrence is a normal phenomenon in the winter season. The average number of snowy day per year varies from around 5 days in flat lying areas and open valleys to more than 100 days per year in the highland areas.

6.2.2 Temperature

The Lowland Zone where has an annual mean temperatures in this zone range from 14°C - 18°C, with temperatures during summer averaging 26°C, whilst winter temperatures average 10°C. The zone is characterized by a hot summer, sometime goes up to 35°C, but only for few days. The winter is not very cold. In both seasons the temperatures are conditioned from the strong influence of Adriatic Sea.

The intermediary zone has some temperatures that ranges between the Southern Highland Zone (Southern part of Central mountain Region) and the Lowland Zone (Adriatic Coastal Lowland Zone). Annual Mean temperature varies from 5°C - 16°C. Mean temperature is highly variable across this zone and declines

moving from the south to the north and with increased elevation The Southern Highland Zone - The Annual Mean temperature decline moving west to east away from the coast, ranges from 6˚C - 14˚C. Summer temperatures average 18°C-20°C, whilst winter temperatures average in the low single digits. The hottest months are in July and August with the average of temperatures range from 18˚C to 24˚C. The daily amplitudes sometimes are 19.7˚C. In this area are registered the absolute minimum temperatures ever experienced in Albania (Voskopoje -30.4˚C and Sheqeras -26.9˚C).

The North of the Central Mountain Zone - The Annual Mean temperature goes from 3˚C - 12˚C. The large range in annual mean temperature is primarily due to elevation. Maximum temperatures in July reach 25˚C, whilst winter minimum temperatures can reach -20˚C.

6.2.3 Wind

On the highlands of Northern Central Mountain Zone, the Southern Central Mountain Zone and in the Intermediary Zones - winds are influenced by the geomorphology of the area; hence the specific site characteristics are important. For example, the four sites at Kukes and close to Tropoja are influenced by the shape of the Drini valley. The same situation occurs in the valley of Devolli and Osum, Branches of the Seman River. It is quite a different situation on the reservoirs situated in Fier and Lushnje. Here the wind is strongly influenced by the air movements from the sea to the earth and vice versa. This wind, conditioned from changes of temperatures from the Sea (from the west) to the land (the east) has a general west/east/west direction. However, at each site, the dominant winds are those with local characteristics. The most predominant are the horizontal winds, running in respect with the valley direction. The permanent winds with low intensity, but with high abundance are vertical winds which are caused by temperature differences between the lower areas and upper mountain or hilly areas. Such winds are called "wind of the slopes".

6.2.4 Ambient Air Quality

In recent years, air quality is monitored at 15 stations in 7 main cities of the Albania, comprising 7 stations in Tirana, 3 in Elbasan and one to each of Shkodra, Durres, Korça, Fier and Vlora respectively. These sites are considered as the most sensitive areas. The elements monitored at these stations are: PM_{10}, LNP, NO^2, SO^2, O3, and Pb. The indicators of SO_2, O^3, NO_2, and Pb are in respect with EU and Albanian Standards.

The ambient air conditions at the reservoirs sites is generally good under natural circumstances and not contaminated by any pollutants, as they are quite far away from the cities or industrial areas. Furthermore, there appear to be no major development activity close to the reservoirs that can affect the air quality, such as quarries, industrial plants, intensive transport etc.

6.3 Geology

The geology of the areas around the dam and reservoir sites are quite different. The Central Mountain Region contains tectonic areas referred to as Korab, Mirdita and a good proportion of Kraste/Cukal and Kruja. The area consists mostly on terrigen formations of reschps of Palaeozoic, Flysch and mollasic deposits. The most abundant rocks are magmatic, effusive sedimentary and calcareous formations. These geologic formations have been affected by powerful neo-tectonic movements of Plio-quaternary, which continues until the present day. The geology of T'Plan reservoir is represented by ultra-basic rocks lying within the Jurassic evaporite area. The Koshnica reservoir is represented by Aleurolite formations of Pliocene age (Helmes Suite). The Leminot reservoir lies in an area of grey marine clays, sands, clays and coal of the Lower Aquitanian formation.

The Intermediary zones, have quite different geological characteristics. The area is situated between Southern Mountain Region, in its South, Western Adriatic Lowland in its West and Central Mountain Region in its East. This Eastern Area, where is situated the Staravecke Reservoir, lies between three tectonic areas, Kruja, Ionian and Sazani respectively. Jurassic calcareous deposits characterize the eastern extreme

of the area. The Staravecke reservoir lies in an area of Palaeogene, Lower Oligocene, with Flysch deposits. The Duhanas reservoir lies in Flysch deposits: sandy clays with limestone layers, of Upper Oligocene Period. Belesova reservoir is characterized by Middle Oligocene formation of weak marine sedimentary deposits of Flysch, containing inter-bedded clay, sand and conglomerate layers. Kurjan/ Strum reservoir lies in an area of Neogene, Pliocene (Rogozhina Suite), Sands, conglomerates. The Zharrez reservoir lies in an area of Neogene and Pliocene rocks (Helmesi Suite). The Murriz Thana reservoir is characterized by Quaternary deposits, molasses rocks (L.Bozo, Y Muceku).

6.4 Seismic Conditions

The FS uses pseudo-static analysis to investigate possible impact of seismic activity on slope stability of the 14 dams. The peak ground acceleration (PGA) for a 475 return period seismic event in the region of the 14 dams was calculated from seismic research undertaken by Aliaj et al (2004), that also presented a relationship between PGA and annual probability. The FS consultants have used other guidance from the United Kingdom also to arrive at a 200 year return period for a operating basis earthquake (OBE). The peak ground acceleration and seismic coefficient (m/s^2) for pseudo static analysis (m/s^2) for the different dams are shown in Table 6-2below

Table 6-2: Calculated Seismic Parameters for dams

Nr.	Dam	Peak ground acceleration (m/s^2)	Seismic coefficient for pseudo static analysis (m/s^2)	Nr.	Dam	Peak ground acceleration (m/s^2)	Seismic coefficient for pseudo static analysis (m/s^2)
1	Murriz Thana Dam	0.28g	0.19g	8	Tregtan 3 Dam	0.21g	0.14g
2	Kurjan Dam	0.28g	0.19g	9	Vranisht 2 Dam	0.21g	0.14g
3	Strum Dam	0.28g	0.19g	10	Koshnica 1 Dam	0.21g	0.14g
4	Leminot Dam	0.32g	0.21g	11	Staravecke Dam	0.17g	0.12g
5	Duhanas Dam	0.25g	0.16g	12	T'Plan Dam	0.21g	0.14g
6	Belesova Dam	0.21g	0.14g	13	Zharrez Dam	0.28g	0.19g
7	Tregtan 2 Dam	0.21g	0.14g	14	Slanica	0.28g	0.19g

Duni Ll., Kuka Sh., Kuka N. and Fundo A.(2010) have attempted to improve the probabilistic seismic hazard map of Albania and this is included as Figure 6-1 below with the locations of the 14 dam sites superimposed on it.

Notwithstanding, it is recognised that the whole of Albania is in an area of seismic activity so even though pseudo static loading analysis has been performed, there are still many input parameters that have been estimated; including the natural geological conditions beneath the dams. Until a more ground investigations and geotechnical analysis are performed by the FS consultant during phase 2 (the detailed design stage) of their project, the seismic coefficient data needs to be treated with caution.

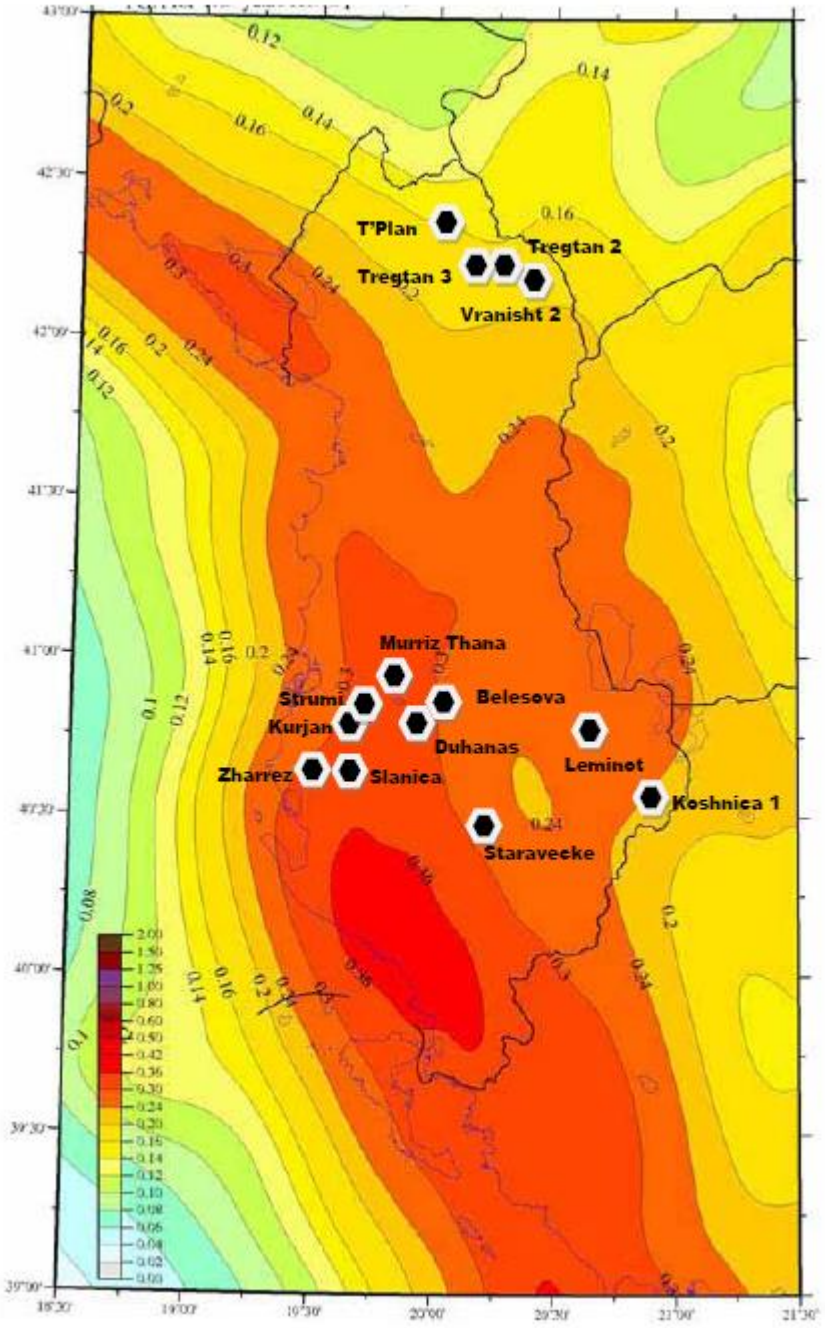


Figure 6-1: Location of dam and I&D sites in relation to seismic hazard probability

6.5 Topography and Geomorphology

The Kukes and southern Tropoja region, where the first group of dams are located are part of the northern section of the Central Mountains Region. The formation and development of the area is related to ultra-basic formations of Kam-Tropoja and limestone of the Cretaceous period. The horizontal relief fragmentation changes from 1-3km/km^2 in the western side to 1km/km^2 in the eastern side[11]. The T'Plan stream links T'Plan depression with Tropoja depression. The stream has created the gorge of T'Plan that is 3 km long. The highest point of this area is the Maja e Gjate at 1,038m, aligned in a north-south direction. Another interesting geomorphological feature of this region is the Tropoja depression an area 19 km long, situated between Morina Gorge and Gri village, which is of tectonic origin. The main surface waters of

[11] Fragmentation of relief is a measure of the degree of erosion and weathering within a landscape and is based upon the measure of the amount of length of linear features (valleys) per square kilometres of land.

this area are the Valbona River and its smaller streams, the Gashi and the Tropoja Rivers. Horizontal fragmentation is around 1-3km/km^2. The vertical fragmentation of the relief ranges from 50-100km/km^2 to 200-300m/km^2.

Some of the reservoirs are part of the Korça depression, which is a relatively flat area about 35km long lying between Morava Mountains, Malit te Thate, Cerrava and Gora highlands. The average altitude of the depression is 137m. Horizontal fragmentation is 0.1 to 0.5 km/km^2. The area is characterized from water sources from the Mali I Thate highlands which include streams of Gjonomadh, Damjanec, of Uji I Bardhe, Kamenica, Mborja etc. The streams activity regarding the moderation of the relief is considerable. The morphology of the field periphery has karstic characteristics. The depression is surrounded by a range of hills such as Vlocishti, Korça etc.

The Eastern part of Intermediary zone geomorphology, is related to the geological structure and the activity of the Staravecke stream. The valley is U-shaped and is filled with sediment. . The eroded slopes continue in the valley to the reservoir. The relief of the area takes the form of five separate terraces (implying different periods of river rejuvenation) that are filled with sediment.

To the West, where are situated the majority of reservoirs in Fier and Lushnje districts, the topography in this area is generally flat to undulating. The reservoir sites are situated in the soil deposits between ranges of hills that are aligned in a north – south direction. The higher points of the hills range from 300 to 600 masl.

6.6 Soil Characteristics

The soil characteristics are quite different throughout the different reservoir and dam sites and are heavily dependent upon the underlying geology, flora and vegetation types, climate and exposure, water presence and effects etc. In the more elevated areas, the soils are prone to heavy erosion. For example, in the upper layer of soils in areas under the study situated in Kukes and Tropoja there are reddish thin layers of silicate alternating with carbonates.

In the area of Murriz Thana dam and I&D scheme in the Lushnje Region and Strum, Kurjan and Zharrez schemes of Fier Region soils are characterized by sandstones and mudstones. Soil classifications of these reservoirs are characterized by Grey-brown soils. They have an accumulative origin, conditioned by river activity and through sediment transport and deposition. The thin soil layers range from 1.2m-1.8m in summer and 0.4m-0.5m in winter. The soils have an average humus and nitrogen content; the meadows of dark grey-brown soils in the Lushnje area have a high humus content (4.3%), nitrogen content (0.22%) and phosphorus content (0.12%). They are rich in $CaCO_3$ (Calcium Carbonate) and have a neutral reaction with a water pH - 6.8. The absorbing compound is of 50% and the terminal infiltration for Lushnje commune is 0.4mm/min -1.6mm/min and for Fier commune 2.3mm/min - 5.5mm/min (ref. Motts FS). Such soil characteristics create very good condition for the development of agriculture and farming in Lushnje and Fier.

The soil of the Slanica, Belesova and Duhanas reservoirs and I&D schemes, in Berat Region, represents a mixture of alluvial and brown mountainous soils and a good part of them are prone to erosion. The land has a middle sub-clay structure, with low phosphorus and humus (6-9%) content, an average nitrogen and calcium content and water pH of 5.5-6. The saturation is high at 90-95% (ref - FS Mott MacDonald). The soils of Koshnica and Leminoti schemes are formed by a mixture of alluvial, brown mountainous and grey forest soils and highly prone to erosion. The lands are covered by sandy sedimentary formations, and on ultra-basic rocks and limestone, and with a clay trend. They are rich in organic matter, the pH is slightly acidic and they are rich in nitrogen, phosphorus and potassium. They have good physical quality and high potential fertility (Motts FS).

In terms of the Word Soil Reference Base Classification (WRC) the following soil types are found:

- **Arenosols:** are soils very little developed with a rough texture (rougher than sand) counterbalanced with sandy -loam or approximately sub-sandy (SS) and sandy (S) according to the national terminology, in a depth level of at least 100 cm from the land surface. Arenosols are leached soils and often decalcified.
- **Phaeozem:** are dark mineral abundant in organic substances, influenced from the climate. These lands have an A horizon - Molic about 30 cm followed by a brown B horizon – Cambic. They have high alkali saturation over 50 %.
- **Regosols** are shallow soils created by both stable matter, mainly from gravels. Those are characterized by low level of humus. In small fraction of soils they have the following characteristics: humus 1.2 -2.2 % , Nitrogen (N) 0.18-0.28%, Phosphate (P 205) 1.4 - 2.5 mg/100 gr /soil and Potassium (K20) 9.5 - 12 mg/100 gr soils. They are of neutral nature, and pH ranges from 7.4 - 7.8. These soils have a high level of Ca= 25%.
- **Leptosol** soils are shallow soils (less than 30 cm deep) lying on he strong rocks or calcareous rocks. In general they have neutral reaction, where pH goes from 6.5 to 7.5. Cationic exchange capacity is around 20 - 30 mek /100 gr ,humus values goes from 1.5 to 2.5 % , N 0.10 - 0.15% ,P205 - about 2 mg /100 gr soils and K20 from 8 - 12 mg /100 gr soils.
- **Cambisol:** are soils with limited age, with transitional characteristics. With light acid reaction. (pH 5.5-6.5) to neutral and light basic (pH 6.5 -8.0) with high levels of Organic Carbon, that goes from 0.3 - 1.7
- **Luvisol:** are mineral soils with a horizon B-Clay, saturation in base with 50% or higher, in all B horizons. Their acid/base ratio range from pH 6.0 to 7.5). The B horizon has a neutral nature.
- **Vertisol:** are considered as soils with high values of concentration of heavy metals. They have high saturation over 80% and neutral reaction that tends to be lightly basic (alkaline), pH (H20).

The Vranisht, Tregtan2 and Tregtan 3 reservoirs have three types of soils present: Cambisol, Luvisol, Regosol. T'Plan reservoir has two types of soils, namely Leptosol, Regosol, Murriz Thana reservoir area is characterized by three types of soils that are Luvisol, Vertisol, Cambisol. Kurjan, Strum, Zharrez and other areas have similar soils characteristics, determined predominantly by Arenosols, Phaeozem, Luvisol, Fluvisol and Cambisol (with characteristics as described above) Soil erosion is a major problem in Albania and especially within the Seman Basin, where proportionally more soil is lost every year compared to other parts of Albania (see Table 6-3).

Table 6-3: Soil Erosion in River Basins in Albania

River	Basin Area (km2)	(ton/km2)/year	(ton/ha)/year	Total Quantity per year (tons x 1000)
Drini	11,756	1,543	15.43	18,145
Semani	5,649	3,085	30.85	17,429
Other Rivers	18,330	1,628	16.28	29,844
Total Territory of Albania	35,735	1,831	18.31	65,418

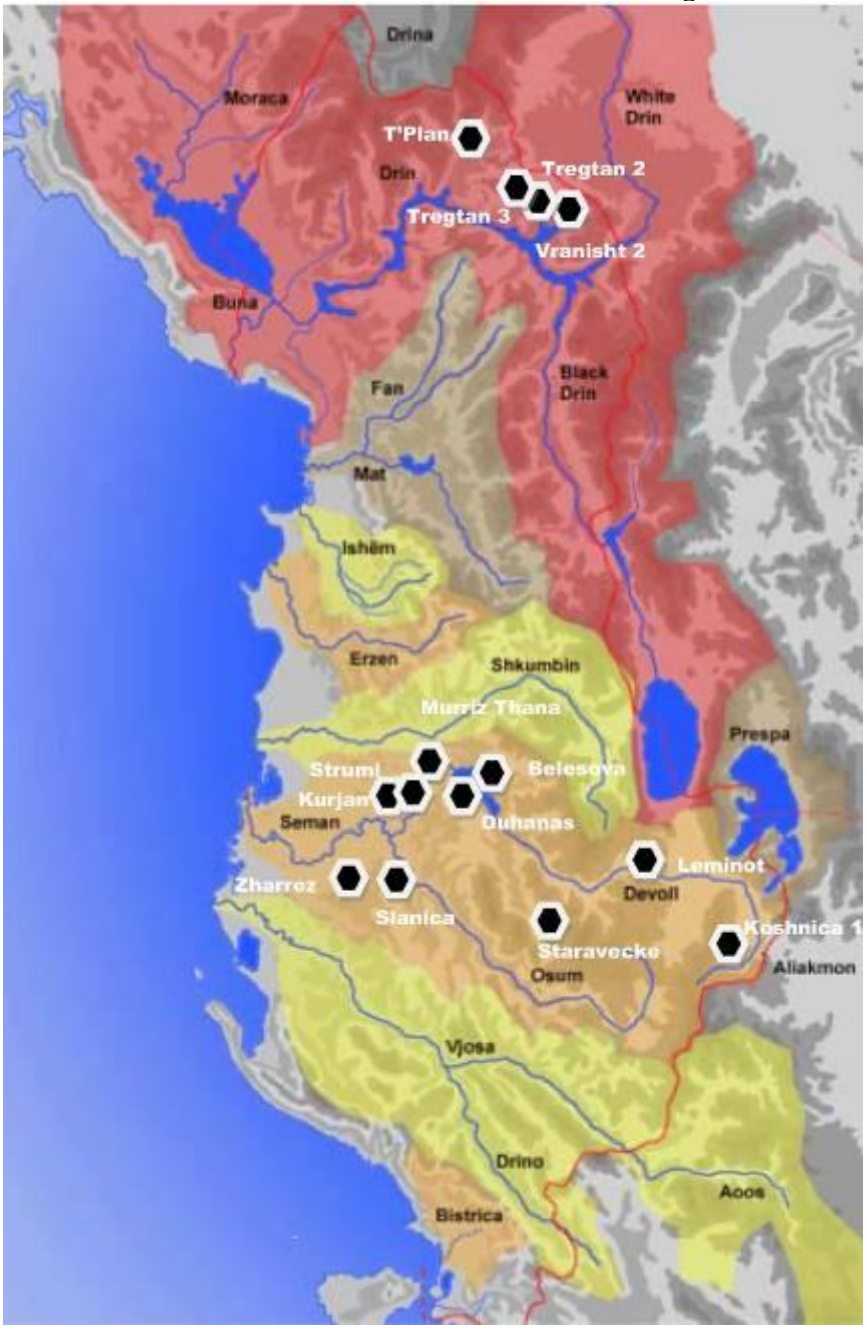
Source: Adapted from Qiriazi and Sala (1999)[12]

6.7 Surface Hydrology and Groundwater

For water management purposes, Albania is divided into six (eight) river basins (Drin-Buna, Matt, Ishem-Erzen, Shkumbin, Seman and Vjose). One third of these basin areas are situated outside the state borders of Albania (i.e. Montenegro, Macedonia, Kosovo and Greece). Total annual water flow rate is 39.22 billion m^3/year of which 95% discharge into the Adriatic Sea and only 5% into the Ionian Sea. There are two different characteristic periods in terms of flow; a wet period (from October to May) with 86% of the annual flows; and a dry period (from June-September), with 14%.

[12] Qiriazi P- Sala S,1999, "Mass Movement in Albania + Human Activities" Japanese Geomorphological Union, 20/3, p.p. 251-264.

Albania is rich in water resources with lakes, rivers, springs and lagoons, with a high quantity of available water. As mentioned above, the Albanian territory covers about 65% of a total watershed area of 43,905 km^2. More than 152 streams and small rivers finally form the eight large rivers and their reaches (in kms) are as follows: Buna (41 km), Drini (285 km), Mati (115 km), Ishmi (74 km), Erzeni (109 km), Shkumbini (181 km), Semani (281 km), and Vjosa (272 km), which run southeast to northwest towards the Adriatic coast. A map of the basins and the locations of the dams is shown in Figure 6-2 below.



Source: Adapted from www.wikipedia.com

Figure 6-2: Location of dam and I&D sites in relation to river basins

Albanian rivers are characterized by a high flow rate; the total annual mean flow is 1,308 m^3.s-1 that corresponds to an annual water volume of 42.25 x 109 m^3 from which 30% belongs to subterranean waters (groundwater). This accounts for more than 13,000 m^3 capita-1.year-1. The rivers, are fed mainly by precipitation (69%), and show a typical Mediterranean regime, with a seasonal variation in the flow rate, with high flow during October to May.

Lakes occupy about 4% of the country, which include three big lakes and 247 small lakes. There are also 650 reservoirs with a capacity of around 5.6 billion m^3 of accumulative water, designed and built along the river, serving for irrigation, flood protection and generation of electricity.

Underground waters are numerous and contribute with about 23% of the total annual flow. They are spread throughout the country and are exploited through natural outflows and wells, serving mainly for drinkable water in 80% of cities in the country, while a very small part of them are used for irrigation, mainly in the western lowlands.

6.7.1 Waters of the Seman River and Drini-Buna River

The Intermediary Zone reservoirs are located mostly within the Seman Valley which is the principle river of the area. The Seman is composed by several branches, where the most important are those of Osum River and the Devolli River (see Figure 6-2). The Seman is 281 km long and has a basin area of 5,949km^2. The average altitude of the river is 863m. The river gradient is around 3.6m/km or 3.6%. The Osum is one of the main branches of the Seman and is 161 km long. It basins is 2,150km^2 with an average altitude of 828m. The river discharges an average of 32.5/m^3/s with a discharge module of 17.5l/s per km^2. Close to Kuçove the Osum joins the Devolli River and becomes the Seman River downstream.

The Southern Part of Central Mountain Region is very rich in surface waters that are derived from lakes and rivers. The main lakes are those of Prespa and Ohrid. Both lakes are trans-boundary lakes, the former representing the division between Albania and Macedonia; and the latter between Albania, Macedonia and Greece. The lakes have international importance and have a specific conservation status. Devolli River is the largest branch and the main source of supply of the Seman River and is 196km long and has an average altitude of 960m. The multi-year average of discharges ranges around 95.7m^3/s, with a discharging module of 17l/s/km^2. The Devolli River feeds the Seman River with about 88% of its waters. Due to the underlying geological characteristics of the basin (e.g. limestone, karst) when the rivers are flowing, the Seman River has relatively high mineralization content (TDS 440mg/litre).

The Highland Zone/Northern Part of Central Mountain Region – is dominated by the Drini River Basin (comprising Black Drin (Drini I Zi) and White Drin (Drini I Bardhe) rivers). The Drini is the longest river of Albania and the basin area includes the land up to the confluence with the Buna River close to Shkodra Lake, where combined (named the Buna River) they discharge into the Adriatic Sea. Both rivers discharge about 21.4 Mm^3 per year and the discharge coefficient of river flows is 0.64 for Drini and 0.90 for the Buna.

The main sources of the Drini River are surface catchments (like the Drini I Bardhe River) and smaller streams in the upper catchment which are all fed by rainfall. The main sources for Buna River are Shkodra Lake and the Drini River. The total catchment area of the Drini Basin is 14,173 km^2, from which 5,870 km^2 lie within Albania and the remainder within Kosovo, Macedonia and Greece. The average altitude for the basin is 971m. From a morphological and hydrographic point of view the river basin is divided into three parts, the upper, middle and lower reaches. All the reservoir sites in question lie within the middle reach of the basin.

All Albanian rivers including the Drini and Buna are characterized by high amount of sediment transportation primarily caused by soil erosion which is caused, in part, by deforestation activities in the catchment. Table 6-4 below provides general parameters on Drini and Buna rivers.

Table 6-4: General Hydrological Characteristics of the Drini and Buna Rivers

Rivers	**Qmaks l/sec/km^2**	**Qmin l/sec/km^2**
Drini river (Black Drin and White Drin)	35.7	7
Black Drin	23.3	7
Buna river	53.6	10

The hydrological monitoring network on the Drin and Seman basins is quite limited. Data has been acquired from four gauges in operation and these are shown in Table 6-5 below together with indications of flood peaks and 20, 50 and 100 year return periods. As can be seen the extreme rainfall experienced in the two basins in 1962-63 was very close to a 1 in 50 year flood event.

Table 6-5: Gauging Stations within Drin and Seman catchments and major flood events

				Flood 62-63		Floods 70-71		Q m^3/s With return period		
No	**River**	**Station**	**Area km^2**	**Q m^3/s**	**Date**	**Q m^3/s**	**Date**	**100 Years**	**50 Years**	**20 Years**
1	Drini	Vau Dejes	13650	**5180**	13.01	**1900**	1.01	6530	5870	4850
2	Devolli	Kozare	3122	**1250**	16.11	**1240**	1.01	1570	1390	1150
3	Osum	Ura Vajguror	2073	**1100**	16.11	**1050**	1.01	1270	1130	958
4	Seman	Ura Kucit	5358	**1800**	16.11	**1870**	1.01	2160	1975	1730

Source: Kolaneci [13]

Recent work undertaken from Pano and Avdyli (2009) has calculated the average monthly discharge for the Drini and Seman rivers based on data between the years 1948 – 2004. The following Table 6-6 below provides indications on the monthly average discharge for the Drini and Seman Rivers.

Table 6-6: Average Monthly Discharge on the Drini and Seman Rivers

Rivers	**Monthly Average Discharge (m^3/sec)**												**Annual avg. Discharge m^3/sec**	**Coeff. of discharge Cv**
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**		
Drini	493	459	446	507	490	293	155	104	141	228	396	501	351	0.30
Seman	143	156	161	143	116	52	20	12	22	41	100	117	90	0.34

Source: Pano, N. and Avdyli B. (2009) [14]

In the 1996 Water Law which his currently in force there is no provision for minimum environmental flow. However, Albania in its' strive for EU Accession has now prepared a draft Water Management Law, which is based upon the EU Water Framework Directive (WFD) most notably WFD Article 4 paragraphs 3-5. There is provision within this draft law for minimum environmental flow. It now is a requirement for minimum environmental flows to be specified in the River Basin Management Plans (RBMP). The WRIP Component 3, Part C will be preparing RBMP for Drin and Seman river basins. The RBMP under WRIP will also provide the framework to address hydropower plant and irrigation and drainage allocation issues with involvement of the River Basin Agency.

6.7.2 Groundwater

The reservoir sites are widely dispersed throughout Albania. Considering the water genesis and hydrological conditions, the reservoir areas under the study are characterized from two types of groundwater; shallow groundwater and deeper artesian groundwater.

Artesian groundwater are deep and phreatic and found mostly in weak sandy and gravel rocks, such as at Korça and Bilisht, where the Leminot and Koshnica reservoirs are situated. Such groundwater generally occurs in synclinal type structures where the nature of the sedimentary beds creates artesian pressure.

Whole/Break Waters (in Albanian "uje I poreve/carjeve") contains deposits of sand/clay of Mio-Pliocene. Such waters have low pressure. The Karstic waters, are strongly related to carbonate rocks (Calcareous and Dolomites), and sulphate rocks (Gypsum and Anhydrites). Usually such rocks have extensive jointing

[13] Kolaneci M., 2000, "Flood Risks in Albania", The World Bank Group, Rural Development, from http://wbln0018.worldbank.org.
[14] Pano, N., and Avdyli B., 2009 A method to estimate Buna Discharge, Albania – Hydrology Days 2009.

and fracturing and are the main source of water for Albania. These waters are the main source for irrigation and industrial supply purposes.

6.7.3 International Waterway Status and Downstream Water Users

International waterways

As mentioned previously, the Drin River has two tributaries the Black Drin and the White Drin. The Black Drin originates in Macedonia and flows into Albania (see Figure 6-2). The White Drin originates in Montenegro, flows into Albania, and meets with the Black Drin in Albanian territory. The Drin River meets at the outskirts of Shkodra with the Buna River, which flows from Shkodra Lake (an international lake shared with Albania and Montenegro) to the Adriatic Sea. Furthermore, the Drin and Seman Rivers are recipients of irrigation water that both eventually flow into the Adriatic Sea, an international waterway. This implies that WB OP 7.50 is triggered and riparian should be notified by Albania, unless there are adequate grounds for exception.

Out of the 14 rehabilitation subprojects identified for the first year of WRIP, four sites lie within the Drin catchment, a transboundary river, namely Tregtan 2, Tregtan 3, Vranisht 2 and T'Plan. The remaining sites all lie within the Seman Basin which flows entirely within Albania and exists to the Adriatic.

In contemplating OP 7.50, the Consultant believes that an exception to this safeguard should be considered for all the 14 sites for the following reason.

The project essentially involves the rehabilitation of existing dams, reservoirs and I&D schemes and does not involve works and activities that would exceed the original irrigation scheme footprint, change its nature, or alter and expand its scope and extent to make it appear a new or different scheme.

Consequently, the project team has determined that given the nature of the rehabilitation works envisaged under the project, the project falls under the exception set forth in paragraph 7 (a) of OP 7.50 as (i) it will not adversely affect the quality or quantity of water flows to other riparian users; and (ii) it will not be adversely affected by other riparian's water use. Furthermore, paragraph 7 (c) of O.P 7.50 applies as both the Drin and the Seman rivers are in Albania, the lowest downstream riparian state and the project will not cause appreciable harm to other states.

Water Users

The 14 dams and I&D schemes located within the Drin and Seman Rivers are generally within the middle reaches of their respective river basins, with the exception of Koshnica1 and Leminot that lie more in the upper reaches of the Devolli River (upstream part of Seman).

There is substantial competition for use of the water resources of the Drin and Seman basins. Hydropower is of particular importance on the Drin, with major dams and associated power stations located upstream in Macedonia and downstream in the middle and lower reaches of the river in Albanian territory, where hydropower accounts for more than 85% of the Country's total electricity supply. The Seman is also becoming more important for hydropower with new HPPs planned on the Devolli and Seman tributaries.

Besides hydropower the Drin and Seman are also important as a water resource for irrigation, livestock, fisheries, industry and for drinking water. In addition, both basins face a number of threats to their water quality, such as pollution mainly from discharges of untreated wastewater from cities. The exceptional biodiversity and endemic species of the Drin Basin as well as those on the Seman River (i.e. particularly those on the Karevasta Lagoon adjacent to the Adriatic) are also under threat without improved and coordinated ecosystem management.

From an international perspective and to address the situation on the Drin, the five River Riparians signed a Memorandum of Understanding on a Shared Strategic Vision for the Sustainable Management of the

Drin River Basin in November 2011. Recent floods highlighted the need for such closer transboundary cooperation. The "Drin Dialogue" process, as it is called, was originally set up in 2009 to look into the many competing interests and challenges the Riparian states were facing. The Shared Strategic Vision identified the challenges at the transboundary level such as:

- Improving access to comprehensive data and adequate information
- Developing cooperation and measures to minimize flooding
- Improving management and appropriate disposal of solid wastes
- Decreasing pollution of nutrients and hazardous substances such as heavy metals and pesticides
- Minimizing the effects of the building of dams and other changes of the water system.

Albania is also a signatory of the Convention for the protection of the Mediterranean Sea against pollution (Barcelona Convention) and its relevance in this context is that pollution from land based resources (including irrigation) through the Drin and Seman rivers should be prevented and addressed.

6.8 Water Quality

The transformation of the Albanian economy to an open market during the past decade caused a significant damage to the natural resources of the country, mainly to natural waters, most of them being the most exposed and unprotected ones. The situation is especially dramatic in the Albanian western lowlands where most of the rivers cross on their way to the Adriatic Sea.

This region became heavily populated and most urban and industrial waste is disposed directly into the rivers. Alas, there are now severe environmental problems in these areas, directly or indirectly linked to aquatic ecosystems, like urban and industrial waste management, water pollution or land erosion. Neither liquid nor solid waste is controlled, nor are samples taken regularly of surface and groundwater.

The Albanian rivers are characterized from high intensity of erosion activity and high turbidity. The Drini River in which the northern sites of T'Plan, Vranisht 2 and Tregtan 2 and 3 are located, have an average range of erosion and turbidity and thus do not suffer from siltation problems as much as other areas.

It is quite another situation with the Seman River and its tributaries (Devolli and Osum). The meandering nature of these rivers changes the rivers courses over the years, thus eroding important agricultural lands and transporting organic matter from eroded soils. Erosion in the upper geological layers fills sediments with heavy metals, eroded from volcanic rocks. When the eroded rocks are calcareous, calcium is the predominant element. The clay soils eroded and transported by streams or water currents remains a problem on sedimentation.

6.8.1 Drini River Irrigation Water Quality

In the Drini River, even taking into account the small pollution sources, this river can be classified within Albania as a relatively clean river. The following are some parameters of the Drini River water quality.

Electrical conductivity value is (ECW) = 0.3ds/m., TDS 300mg/l, SAR = 0.1. $N^{+}+K^{+}/Ca^{++}+Mg^{++}$ ratio < 1, when the impermeable value is considered 2, implies that the water has very good proprieties for irrigation purposes. Furthermore, the ratio Cl^{-}/SO_{4}^{-} = 1.1, pH = 6.8-7.5, $N\text{-}NO_3$ = 2.7 mg/l, $N\text{-}NH_4$ = 1.8 mg/l, P = 0.2 mg/l, K = 1 mg/l all show that the water quality for irrigation purposes is very appropriate.

Recent research (2006-2010) on irrigation water quality from rivers and reservoirs in Albania has shown that the Drini River is within the State Standard Catalogue (SSC) accepted values.[15] The results are presented in Table 6-7 below.

[15] Abazi U., and Balliu A., 2012, "Evaluation of irrigation water quality across major water resources in Albania during a five year monitoring process" in Journal of Food Agriculture and Environment, Volume 10 pp 919-924

Table 6-7: Water Quality Results from Drini River 2007-2010

Water parameters	Symbols	Units	SSC Accepted value	2007	2008	2009	2010
Electrical Conductivity (or)	ECw	dS/m	0 to 3	0.28	0.27	0.29	0.30
Calcium	Ca2+	me/l	0 to 20	1.88	2.15	3.15	3.07
Magnesium	Mg2+	me/l	0 to 5	0.94	0.87	1.23	1.02
Sodium	Na+	me/l	0 to 40	0.13	0.12	0.13	0.10
Carbonate	CO3 2-	me/l	0 to 1	0.20	0.30	0.32	0.32
Bicarbonate	HCO3 -	me/l	0 to 10	1.60	1.92	1.84	1.11
Chloride	Cl-	me/l	0 to 30	0.40	0.60	0.45	0.36
Sulphate	SO4 2-	me/l	0 to 20	2.85	0.81	0.30	0.20
Nitrate-Nitrogen	NO3-N	mg/l	0 to 10	1.12	4.76	3.92	1.84
Ammonium-Nitrogen	NH4-N	mg/l	0 to 5	0.56	2.24	1.68	1.70
Phosphate-Phosphorus	PO4-P	mg/l	0 to 2	0.20	0.30	0.40	0.71
Potassium	K+	mg/l	0 to 2	0.22	1.03	1.17	1.18
Acid/Basic	pH	1-14	6.0 to 8.5	6.80	7.50	7.20	7.10
Sodium Absorption Ratio	SAR	me/l	0 to 9	0.12	0.10	0.10	0.10
Dried residue	DR	gr/l-1	-	0.12	0.19	0.16	0.18

The results show a low electrical conductivity, and with a very small variability. The anion and cation values are within the parameters set by SSC. The content of carbonate was between 0.20-0.32 me/L, increasing from the first to the fourth sampling year, but still within the acceptable levels of SSC. The opposite happened with the content of bicarbonate, but again the concentrations are within the norms set by SSC. Phosphate had relatively high values (max = 0.71 mg L^{-1}) which could be due to an additional source of P being added to the irrigated soils at the time of sampling. Based on these results, Drini river water is classified as Class II for irrigation.

6.8.2 Seman River Irrigation Water Quality

Some investigations have also been undertaken on the water quality of the Seman River. The following are given some general data on water quality and heavy metals in sediments (see Table 6-8).

Table 6-8: Water Quality from the Seman River

Physical chemical parameters	Mean Nutrient Levels	Max values of heavy metals in waters	Max values of heavy metals in sediments		Max values of heavy metals in algae *Cladophora*
			Min	Max	
Pb = 2.9	*N-NO_3(mg/l)* 1.26	*Pb* = 2.9	*Pb* = 1.03	*Pb* = 9.46	*Pb* = 5.6
Cd =3.2		*Cd* = 3.2	*Cd* = 0.02	*Cd* = 0.06	*Cd* = 0.25
Cu =2.7	*N-NO_2(µg/l)* 108.3	*Cu* = 2.7	*Cu* = 38.4	*Cu* = 144	*Cu* = 18.9
Zn =20		*Zn* = 20	*Zn* = 17.9	*Zn* = 47.4	*Zn* = 117.2
Ni = 16.8	*N-NH_4(mg/l)* 1.84	*Ni* = 16.8	*Ni* = 131	*Ni* = 289	*Ni* = 168.5
Cr =10.0		*Cr* = 10.0	*Cr* = 101	*Cr* = 429	*Cr* = 231.7
Mn =110		*Mn* = 110	*Mn* = 556	*Mn* = 990	*Mn* = 724.4
Fe =0.83	*P-PO_4(µg/l)* 43.8	*Fe* = 0.83	*Fe* = 2.37	*Fe* = 3.82	*Fe* = 6647
Hg =0.21		*Hg* = 0.21	*Hg* = 0.08	*Hg* = 0.17	*Hg* = 0.09

Source: Elaborated from EA of water quality of Albanian Rivers

Hence, the Seman River remains problematic in relation to particulate matter, because of erosion and sedimentation. The guide limit of CEE for Total Suspended Solids (TSS) is 25 mg/l. The Seman has a TSS with a max of 436 mg/l! Dissolved Oxygen (DO) is less than 2 mg/l, which implies "very poor" status

according to NIVA classes (Norwegian Water Agency).

Seman River waters also exceed the ammonium limit of 0.16 mg/l N-NH_4 of EC Directive for cyprinid waters. Regarding physical-chemical parameters the quality of Seman River waters can be considered as fair, poor to very poor. From a heavy metals point of view, the Seman River can be considered as markedly polluted. Still in the upper and middle reaches the pollution is not really present. It should be mentioned that this situation is principally related to human activities, especially in the lower reaches of the river due to intensively inhabited areas and cities.

More recent research (2006-2010) on irrigation water quality from rivers and reservoirs in Albania has shown that the Seman River is within the State Standard Catalogue (SSC) accepted values. Samples have been taken and are shown in Table 6-9 below

Table 6-9: Water Quality Results from Seman River 2007-2010

Water parameters	Symbols	Units	SSC Accepted value	2007	2008	2009	2010
Electrical Conductivity (or)	ECw	dS/m	0 to 3	0.54	0.40	0.42	0.20
Calcium	Ca2+	me/l	0 to 20	2.60	1.50	4.20	2.20
Magnesium	Mg2+	me/l	0 to 5	2.70	1.20	1.90	1.00
Sodium	Na+	me/l	0 to 40	0.30	1.60	1.40	1.10
Carbonate	CO3 2-	me/l	0 to 1	-	0.30	0.40	0.30
Bicarbonate	HCO3 -	me/l	0 to 10	3.50	2.10	2.50	1.20
Chloride	Cl-	me/l	0 to 30	0.60	0.60	0.70	0.20
Sulphate	SO4 2-	me/l	0 to 20	1.80	0.60	0.20	0.20
Nitrate-Nitrogen	NO3-N	mg/l	0 to 10	0.60	2.20	1.40	2.50
Ammonium-Nitrogen	NH4-N	mg/l	0 to 5	0.60	1.10	0.30	1.10
Phosphate-Phosphorus	PO4-P	mg/l	0 to 2	-	-	0.90	0.80
Potassium	K+	mg/l	0 to 2	2.90	4.70	22.50	0.70
Acid/Basic	pH	1-14	6.0 to 8.5	7.30	7.70	7.60	7.20
Sodium Absorption Ratio	SAR	me/l	0 to 9	0.20	1.40	0.80	0.90
Dried residue	DR	gr/l-1	-	0.20	0.20	0.30	0.10

The measurement at this river showed low values of EC (0.20-0.54 dS m^{-1}), nitrate (0.6-2.5 mgL^{-1}) and ammonia (0.3-1.1 mg L^{-1}). Cation and anion concentrations as well as pH values (7.2-7.7), were within the accepted limits set by the SSC to prevent salt accumulation in soils. During the sampling period, only potassium K^+ concentration in 2009 (22.5 mg L^{-1}) and CO_3^{2-} concentration from 2008 to 2010 (0.3- 0.4 me L^{-1}) were above the limits established by the SSC standards. The high K^+ can be explained by urban wastewater discharge coming from the city of Fier, which was upstream of the river sampling point, while the relatively high $CaCO_3$ concentration can be explained by the high carbonate content of the soils and the parent materials in the Seman basin. Based on these results, the waters of the Seman River can be classified as Class II for irrigation purposes.

6.8.3 Irrigation Water Quality from Selected Reservoirs and I&D schemes

In the areas of the Zharrez, Slanica, Duhanas and Belesova reservoirs and I&D schemes, erosion is very active and sediments are deposited in the channels, silting them frequently and reducing their capability. The same situation is happening in reservoir bodies where substantial siltation is apparent. In some of the reservoirs the capacity is reduced by more than 60%.

Through an historic evaluation of data, all the reservoirs have appropriate water quality for irrigation, except the Murriz Thana reservoir, that in the dry season, (mostly in the August and beginning of September) is characterized by high salinity. Through several chemical analyses, it has been found that in some years the level of salinity in the reservoir water risks damaging the crops during irrigation. This high salinity appears to coincide with reduction in flow of the Devolli River. Concentrations of sodium and chlorine can create toxicity problems in susceptible crops (e.g. most vegetable crops). Hence application of irrigated water during this time can lead to reduction in crop yields.

Illegal disposal of solid matter or debris close to or in these irrigation channels is polluting these waters. Furthermore, wastewater generated through rainfall risks being discharged into the reservoir or the irrigation channels. In Zharrez reservoir, contamination of waters from the nearby oil industry in the past has occurred. Numerous hotspot removal projects have helped to contain this oil. A more detailed analysis of the water quality from the Murriz Thana and Zharrez reservoirs will be included and elaborated on in the site specific ESMPs

The Biological Environment

6.9 Protected Areas

Such Albanian protected areas are those territories, seas or inland waters and territories that represent a higher value of local, regional, national or global importance from the viewpoint of biodiversity or habitat, landscape or reproduction capacity that is significant for conservation of natural resources. The management categories of Albanian Protected Areas are divided in accordance with IUCN categories. Some 15% of Albania's surface is protected at present. The Albanian Government policy is to increase these areas regarding environmental protection. The total number of categories of Protected Area and their surface area are shown in Table 6-10 below: Further details of the protected areas are shown in Annex D.

Table 6-10: Details of Protected areas in Albania

Type of Protected Area	No Designated	Surface area (hectares)
Strictly Protected Area	2	4,800
National Parks	15	189,088
Natural Monuments	750	3,470
Nature Managed Reserve	22	2,530
Protected Landscape / Seascape	5	959
Multiuse Protected Area/ Protected Area of Managed Resources	4	18
TOTAL	**798**	**200,865**

Table 6-11 below provides indications of the protected areas that lie within the districts where the dam and reservoir sites together with I&D schemes planned for rehabilitation are located. In addition, this information is also shown on Figure 6-3 below. It can be clearly seen that none of the dam, reservoir and I&D rehabilitation sites are close to these protected areas

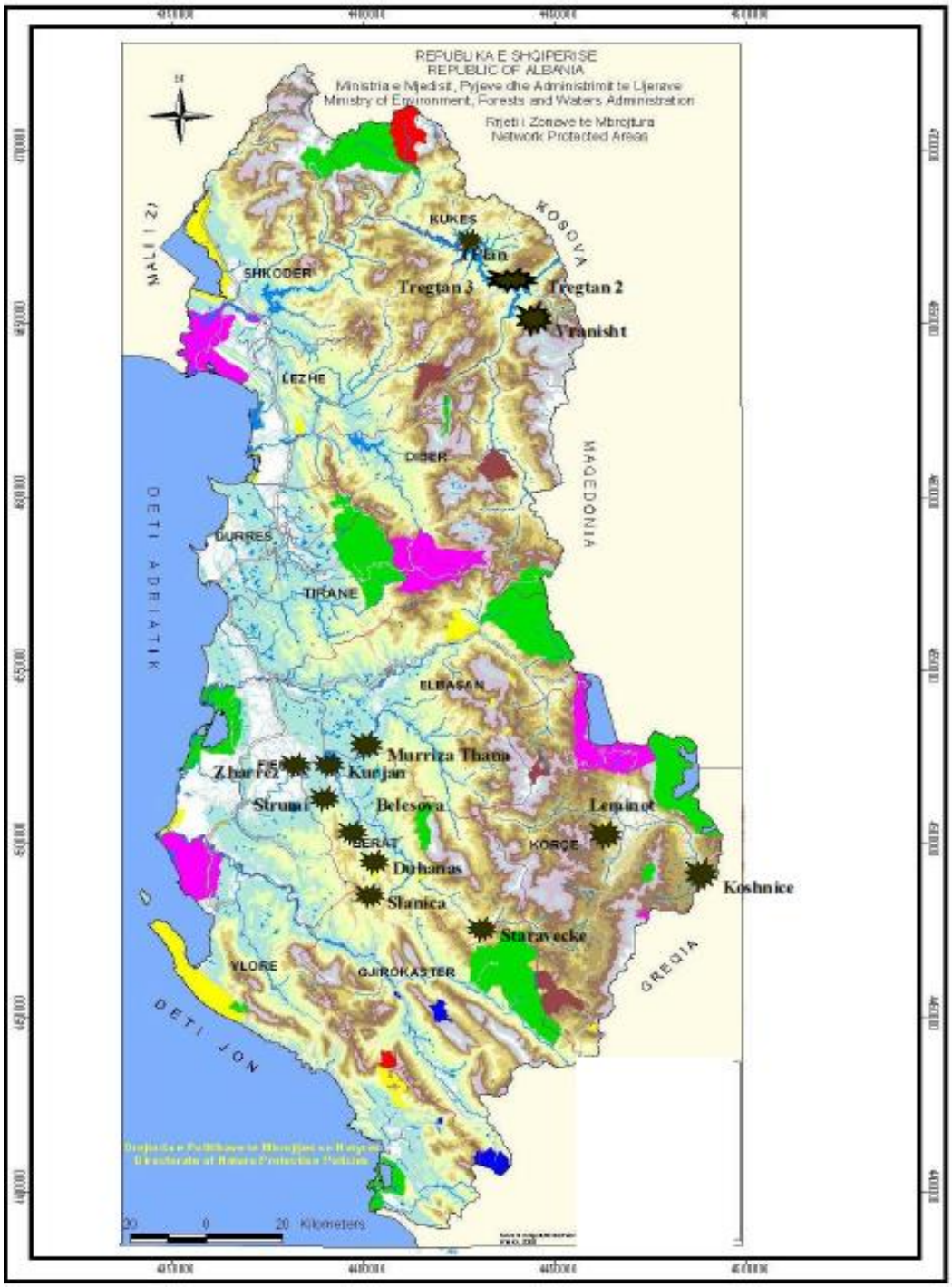


Figure 6-3: Location of the Project sites in relation to protected areas

Legend

- Strictly Protected Areas
- National Parks
- Natural Monuments
- Natural Managed Reserves
- Protected Landscapes
- Managed Resource Protected Area
- Dam and Reservoir Site

Table 6-11: Details of Protected areas in Districts containing reservoirs under the study

District	Reservoirs in District	Name of Protected Area	Management Category	Surface area (hectares)
Kukes	T'Plan Tregtan 2 Tregtan 3 Vranisht 2	Lumi I Gashit (Gashi River)	Strict Protected Area	3,000
		Lugina e Valbones (Valbona Valley)	National Park	8,000
Fier	Murriz Thana Kurjan Strumi Zharrez	Divjake/Karavasta	National Park	22,230
Berat	Duhanas Belesova Staravecke Slanica	Mali I Tomorrit	National Park	4,000
Korce/ Gjirokaster	Leminoti Koshnica 1	Dangelli	National Park	34,361
		Prespa	National Park	27,750
		Bredhi I Hotoves	National Park	2,380

This information about protected areas is included as it provides an overall perspective of the area surrounding the different dam, reservoir and I&D schemes rehabilitation sub-projects. Furthermore, it is normal procedure when preparing environmental documentation under Albanian law (be it Summary EIA or Profound EIA) to show the proximity of project sites in relation to such protected areas.

6.10 Flora

Climate, geographical position, presence of water and specific topography are important factors that influence the abundant green cover, diversity, uniqueness of the vegetation within Albania. Albanian flora comprise around 3,200 species recorded of which about 15% are characteristic of Balkan environments, 24% exhibit typical Mediterranean characteristics and the remainder are with a Central European origin, sub-Balkan etc.

The flora of Albania consists in Tertiary plants (relic plants), from which around 350 species are trees and shrubs, 85% of which has a spontaneous distribution in natural conditions (endemic), and 15% of them are introduced. Albania is considered as one of the most important migratory sites for plants in the Balkans.

In Albania, there exist 32 endemic plants and 148 sub-endemic plants. Between them can be mentioned Plantain species (*Wulfenia baldaccii),* European Forsythia *(Forsythia europaea)*, etc. In the "Red Book" of Albania 305 species of plant are listed with "Threatened" or "Rare" status. Forests and pastures have a high value and are an important habitat for specific flora. The most important parts of the forests in this instance are situated in the northeast and southeast parts of Albania.

The vegetation of the sites under the study are categorized on those continentals (Highland sites) with Central European species associated with a Mediterranean climate elements, and those of Mediterranean element mixed sometime with European ones in the lower zones (i.e. in Fier and Lushnje districts) and intermediary ones (i.e. in Berat and Skrapar districts). The natural vegetated areas surrounding the study sites exhibit "bush" vegetation, comprised by evergreen makia. In the hills, below 800masl, this vegetation is substituted by plantations, mostly olives or fruit trees. With increasing altitude the main vegetation changes to oak (*Quercus),* beech (*Fagus Sylvatica*), as well as hop hornbeam (*Ostria Carpinifolia)* and oriental hornbeam (*Carpinus Orientalis*). At the altitude of 1,000masl and above woodlands of ash (*Fraxinus*) and pine (*Pinus*) appear.

6.11 Fauna

Fauna of Albania consists mostly in European elements, mixed also with Mediterranean elements and Balkan sub-endemics. Albania is a natural bio-corridor of fauna from the north to the south of Europe and also in Africa and Asian continents. There are 46 species of echinoderms, 115 crustaceans and 510 molluscs, living in water bodies of seas, rivers and lakes.

In Albania 4,000 species of insects have been recorded, 313 species and sub-species of fish, where 64 species lives in rivers and lakes and 249 species lives in sea and lagoon waters. From this 4 endemic species, can be counted. Amphibians consist of 15 species and there are 37 species of reptile. Birds represent 323 species from which 72 species lives in the forests. 43 species have specific conservation status and are under protection. Mammals consist of 69 species, and about 42% are European representatives. 64 mammals are inland animals and 5 lives within sea habitats.

The fauna of the sites under the study consists mostly on the fauna with Balkan and European elements. The areas surrounding the sites are not very rich in wildlife primarily due to the close proximity of human settlement that has existed in the area for a long period of time. In the more remote forest areas wolves, bears, wild cats and other mammals occur and have a protected status.

Around the reservoir sites and their surroundings many different kind of raptors, reptiles and amphibians can be seen. The lake waters have some fish species introduced such as carp (*Cyprinidae*) etc. Within the upper streams of the study areas indigenous fish species (i.e. Greyling (*Salmos Thymallus)*) are observed.

6.12 Threatened flora and fauna in the Project Area

The reservoir sites and I&D schemes are situated within areas which have been predominantly adapted for agricultural production. From the surveys undertaken at the time of the site visits to the 14 reservoirs and dam sites and the main irrigation channels no flora or fauna was identified within these project areas that could be considered to be at risk or threatened.

Notwithstanding, below are listed some of the flora and fauna which are threatened or at risk status in the regions of Kukes/Tropoja (Group 1 dams and I&D schemes), Korça (Group 2 dams and I&D schemes), Berat/Skrapare, Fier and Lushnje (Group 3 dams and I&D schemes), that are listed by Albanian Red Book of Flora and Red Book and Red List of Fauna (taken after the International Union for the Conservation of Nature – IUCN). The species mentioned below are selected by region and altitude of their habitats, habitat characteristics such as wetlands, lakes, river valleys etc.

6.12.1 Flora and vegetation

Comfrey (*Symphytum officcinale)*, that lives in Oak forests.
Yew *(Taxus baccata)*, that lives in Oak forests
Balkan Maple *(Acer hyrcannum)*, wood, in oak and beech forest
Bearberry *(Arctostaphyllos uva-ursi)*, bush
Male fern *(Dryopteris filix-mas)*, lives in pastures and other open areas
Holly Oak *(Querqus ile)x*, wood lives in forests and bush areas.
Winter Savory (*Satureja Montana)*, low plant lives in mountain areas
Mountain Tea *(Sideritis Rasaeri)*, lives in rocky mountain areas, found also in Tomorri Mountain National Park
Horse Mushroom (*Agaricus arvensis Schaeeff)*, mostly within Fier Region,

Between the animals with a threatened status in the areas under the study, can be counted:
Fishes
Ray Finned Fish *(Alburnoides Fanfangae)*, genus Alburnoides, endemic fishes, found in upper Osum River and (*Alburnoides Devolli)*, genus Alburnoides, endemic fishes, found in upper Devolli River

6.12.2 Amphibians and reptiles

Fire Salamander *(Salamandra salamandra)*, in Korça and Kukes region, threatened status,
Great Crested Newt or Warty Newt *(Triturus cristatus)*, in Korca, Kukes, Berat region, threatened.
Common Toad *(Bufo bufo)*, in all regions, prefer wetlands and lakes, threatened
Greek March Frog *(Rana balcanica – now called Pelophylax kurtmuelleri*), in all regions, but prefer wetlands and lakes, threatened

6.12.3 Birds

Pelican, (*Pelecanus crispus*), lives in Lushnje region, Karavasta Lagoon, internationally protected, threatened,
Bearded Vulture (*Gyapetus barbatus)*, in Korca region, threatened,
Rough Legged Buzzard (*Buteo Lagopus*), in Fier region and River Seman surroundings, threatened
Hazel Grouse (*Bonassa bonasia*), Kukes, threatened
Little Ringed Plover (*Charadrius dubrius)*, Korça, threatened
In the surroundings of reservoirs, several decorative and singing birds are meet during the field works, like warblers and finches. Between the birds with endemic status can be counted three species of Carduelis:
European Goldfinch *(Carduelis carduelis balcanica)*, threatened.
Eurasian Siskin *(Carduelis spinus)*, vulnerable (migratory bird that live in Albania during winter and the first part of the spring).
Greenfinch *(Carduelis cloris)*, threatened

6.12.4 Mammals

Blasius Horseshoe Bat *(Rinhopelus blasmii)*, in Korca region, threatened
Brown Bear (*Ursus arctos)*, in eastern Central Mountain Region
Grey Wolf (*Canis lupus)*, in eastern Central Mountain Region
European Otter (*Lutra lutra)*, in lakes and rivers
European Polecat (*Mustela plutoris)*, in eastern Albania
Wild Cat (*Felis silvestri)*, In eastern mountain areas,

The Socio Economic Environment

The sites are distributed in Eastern (Kukes, Tropoja and Korça), central (Fier and Eastern of Lushnje) and South/Central (Skrapare) part of Albania. Due to limited time, the socio-economic team focused on exploitation of existing documentation from the following sources:

- INSTAT Albania from the year 2010,
- the Mott MacDonald FS,
- Communes offices, as well as
- Field observation for verification and filling data gaps.

The social economic assessment focused on the Kukes, Korça, Fier, Berat and Lushnje regions (prefectures) where the 14 dam and I&D schemes are located. In the following are given general data related to regions, other data related to communes where the reservoirs are located, and data on agriculture and land use from the reservoir sites.

6.13 Demography

Table 6-12 below provides an indication of the population structure between rural and urban dwellers in the districts. In general there are more people living within the rural areas than in urban centres. This can be interpreted by the importance of agriculture development and irrigation needs in such regions.

Table 6-12: Natural demographic structure of the Districts

District/Prefecture	Gjendja ne fillim / Balance at the beginning	Lindje / Live births	Vdekje / Deaths	Vdekje / Deaths		Martesa / marriages	Gjendja ne fund / Balance at the end
				nën 1vj. / under 1yrs	1-4 vjeç / 1-4 yrs		
Fier							
Rrethi / District	267116	3172	1158	14	4	1749	269452
Bashkia / Urban	115668	1248	516	4	1	678	117074
Komunat / Rural	151448	1924	642	10	3	1071	152378
Kukes							
Rrethi / District	61546	731	235	2	1	304	61851
Bashkia / Urban	21584	257	91	0	1	128	23161
Komunat Rural	39962	474	144	2	0	176	38690
Lushnje							
Rrethi / District	178875	1350	828	7	2	1079	179812
Bashkia / Urban	68309	490	330	4	0	370	68414
Komunat Rural	110566	860	498	3	2	709	111398
Berat							
Rrethi / District	154944	1295	686	3	2	877	156254
Bashkia / Urban	71950	486	305	0	0	342	72473
Komunat Rural	82994	809	381	3	2	535	83781
Korça							
Rrethi / District	201304	1689	1156	4	3	981	201483
Bashkia / Urban	92690	398	603	0	0	333	92801
Komunat Rural	108614	1291	553	4	3	648	108682

6.13.1 Migration

Overall migration has been one of the main demographic problems in all regions changing considerably the population ratios and structure. During the years 1990-2000, an important part of labour force migrated outside of Albania. Migrants from Kukes went mainly to the UK; those from Korça went to Greece, Germany, Italy and US. In the other areas (e.g. Berat, Fier and Lushnje regions) people have migrated mostly to Italy and Germany, and lesser amount to Greece. Once the migrants found employment in these countries and became officially registered in these Western countries, they took their families with them.

Late in 2000, these large movements of population have ceased. In 2010, when Albania attained the right for free movement within EU countries, the migration phenomenon stopped. In the last two years due to the global economic crisis, migrants are now returning home and investing in their home country (See Table 6-13). The economic crisis in Greece in particular has caused a major migration of Albanians from Greece to their home towns and villages. These people are considered a very important future labour force, but it is important that they obtain employment; hence development of the rural areas is very important.

Table 6-13: Migration within the Districts

District/Prefecture	Të ardhur / Migration IN			Larguar / Migration OUT			Shtesa Absolute / Absolute Total
	Gjithesej / Total	Brenda rrethit / Within the district	Jashtë Rrethit / Outside the district	Gjithsej / Total	Brenda Rrethit / Within the district	Jashtë rrethit / Outside the district	
Fier							
Rrethi / District	4290	2266	2124	4068	2064	2004	222
Bashkia / Urban	2618	1403	1215	1944	869	1075	674

District/Prefecture	Të ardhur / Migration IN			Larguar / Migration OUT			Shtesa Absolute / Absolute Total
	Gjithesej / Total	Brenda rrethit / Within the district	Jashtë Rrethit / Outside the district	Gjithsej / Total	Brenda Rrethit / Within the district	Jashtë rrethit / Outside the district	
Komuna / Rural	1772	863	909	2124	1195	929	-352
Kukes							
Rrethi / District	809	809	0	365	0	365	444
Bashkia / Urban	273	273	0	115	0	115	158
Komuna / Rural	536	536	0	250	0	250	286
Lushnje							
Rrethi / District	3342	1668	1374	2922	1069	1853	420
Bashkia / Urban	1145	730	415	1200	457	743	-55
Komuna / Rural	2197	938	1259	1722	612	1110	475
Berat							
Rrethi / District	3097	0	0	1787	0	0	1310
Bashkia / Urban	1093	0	0	571	0	0	522
Komuna / Rural	2004	0	0	1216	0	0	788
Korça							
Rrethi / District	2175			2538			-363
Bashkia / Urban	985			603			382
Komuna / Rural	1199			1869			-670

6.13.2 Population, economics and families

The family is the foundation of the social structure in the study regions. In general there is a family head, which is considered an adult male, who provides the greater part of incomes. A family unit is often considered the husband, wife and children, but in some cases also the grandmother and grandfather. The following Table 6-14 provides details of the numbers of families, family ratio and structure, which appears to be quite normal for all regions. The most populated district is that of Fier, and then Lushnje, Berat, Korça etc.

Table 6-14: Population and Families within the Districts

FIER DISTRICT	**Gjithsej / Total**	**Nga e cila:Femra / from which Female**	**Nga e cila Meshkuj / from which Male**	**Numri I / Familjeve/ Number of Families**
Gjithsej rrethi / District total	269452	131573	137879	69878
-Bashkia / Urban	127518	62908	64610	36362
Komunë / Rural	141934	68665	73269	33516
KUKES DISTRICT	**Gjithsej / Total**	**Nga e cila:Femra / from which Female**	**Nga e cila Meshkuj / from which Male**	**Numri I / Familjeve/ Number of Families**
Gjithsej rrethi / District total	61851	31609	30242	13371
-Bashkia / Urban	23161	11535	11626	4547
Komunë / Rural	38690	20074	18616	8824
LUSHNJE DISTRICT	**Gjithsej / Total**	**Nga e cila:Femra / from which Female**	**Nga e cila Meshkuj / from which Male**	**Numri I / Familjeve/ Number of Families**
Gjithsej rrethi / District total	179812	92113	87699	46363
-Bashkia / Urban	68414	34699	33715	18617
Komunë / Rural	111398	57414	53984	27746
BERAT DISTRICT	**Gjithsej / Total**	**Nga e cila:Femra / from which Female**	**Nga e cila Meshkuj / from which Male**	**Numri I / Familjeve/ Number of Families**
Gjithsej rrethi / District total	156254	78849	77405	40244
-Bashkia / Urban	72473	35862	36611	18715
Komunë / Rural	83781	42987	40794	21529
KORCA DISTRICT	**Gjithsej / Total**	**Nga e cila:Femra / from which Female**	**Nga e cila Meshkuj / from which Male**	**Numri I / Familjeve/ Number of Families**
Gjithsej rrethi / District total	143271	71379	71892	62793
-Bashkia / Urban	59825	30503	29322	333
Komunë / Rural	83446	40876	42570	648

6.13.3 Farm Sizes

The majority of farms in Albania are family farms with the average size in hectares reported to be 1.2ha/farm. The following Table 6-15 presents this data by scheme indicating number of families and dependent population:

Table 6-15: Average Farm Size and numbers of families within the schemes

Scheme	Average Farm Size reported by commune (Hectare)	Average Farm Size reported by MAFCP for region (Hectare)	Number of Farms	Number of Families	Total Dependent Population
T'Plan	1	0.62	600	735	2567
Vranisht 2	1.2	0.62	180	262	1050
Tregtan2	1.1	0.62	275	340	1370
Tregtan3	1.1	0.62	165	220	825
Murriz Thane	1.8	1.64	23226	Nd	Nd
Kurjan and Strum	1.5	1.64	8373	10299	51715
Zharrez	1.4	1.64	1678	1942	8606
Slanica	1.4	1.37	2550	2900	12750
Belesova	1.2	1.37	1470	1850	6900
Duhanas	1.2	1.37	1080	1260	3960
Staravecke	0.5	1.37	300	322	1465
Leminot	0.7	1.45	1141	1624	6060
Koshnica 1	0.62	1.45	912	912	3280

Source: Adapted from Mott MacDonald Feasibility Study

6.14 Unemployment and employment

6.14.1 Unemployment

Unemployment is quite a big problem in Albania as it is in many parts of Europe. The official number of unemployed is large (~35%)[16], but it should be mentioned that an important part of the labour force is working in the black economy (underground economy) for example working in part time employment or in unregistered entities, hence people are taking their salaries but are not registered at offices. The part of labour force in general is not insured at health and civil offices, and this reduces their possibility to be treated in public health institutions, without additional expenditures. Such a situation reduces and risks seriously the financial incomes of their families. Most of the population are employed in private enterprises. In cities and towns a part of the labour force is employed at state offices. A much smaller part of commune population is employed in state local offices and this number is insignificant.

The population of rural areas, in general is self-employed in their own farms. These families are dependent upon agricultural production and marketing their produce. In general, also these farmer families are not insured for health and social purposes. Only in rare cases some of the village peoples are working in state offices, like the police force, post office, communal services etc. All people employed within the state services are covered for health and social insurance. The following Table 6-16 provides indications of unemployment in the districts; this is made up of three sources:

- Unemployed that are processed and receive benefit and social assistance (treated),
- Those unemployed for the first time on the labour market, and
- Other unemployed.

The unemployment trends are quite typical; with more women than men out of work. A larger proportion of over 35 are out of work and far more people that received little education are out of work. More details on unemployment are contained in Annex E.

[16] Source is CIA – World Fact book

Table 6-16: Unemployment within the Districts

District	Total Population	Overall Total Unemployed	Female	family head (Male)	By Age				By Education Level			
					15-19	20-24	25-34	Over 35	Kinder 8 years	High School	Professional school	University
Fier	269452	9794	6306	2857	418	889	2063	6424	4771	2507	2332	184
Kukes	61851	4937	2318	2087	432	403	1703	2399	2258	1635	971	73
Lushnje	179812	6596	3311	2547	459	934	2269	2934	3486	1710	1143	257
Berat	156254	3253	1448	1578	87	238	510	2418	1867	446	855	85
Korça	143271	4923	2712	1847	121	493	849	3512	3178	1007	519	219

6.14.2 Employment

Data on the number of people in employment is quite difficult to obtain because of the factor of the underground economy mentioned earlier. Details of those employed in the state sector for 2010 are available. This is contained in Table 6-17 below. Much more details on employment are contained in Annex E.

Table 6-17: Unemployment within the Districts

District	Average No or people employed in 2010	Total Female	Total Male
Fier	9585	3745	5840
Kukes	3163	2006	1157
Lushnje	3449	1872	1577
Berat	4372	2425	1947
Korça	5771	No data	No data
TOTAL	**26340**	**10048**	**10521**

6.15 Ethnicity, Religion, Education, Health and Currency

6.15.1 Ethnicity and religion

The ethnicity of all areas is quite similar. The basic ethnicity in all regions under the study is Albanian, and also the nationality. The language used as well as the official language is Albanian. There are three religions; Islamic, Orthodox and Catholic which follow a similar pattern to the rest of Albania.

In the areas under the study the main religion is Islamic, and in some areas (e.g. Korça) also Orthodox due to the proximity to Greece. The different religion groups, all of them with Albanian ethnicity, generally get on well together. This compatibility of the religions has implied that there are many intermarriages between different faiths. In all religion groups, including Islamic faiths there are no cases of fanaticism.

6.15.2 Education

The education system in Albania is broken down into the following categories:

- preliminary elementary school,
- elementary school,
- medium school,
- Universities and
- post University

Albanian is the main language used in all schools. The schools are private or state run institutions. In the towns of Korça and Fier there are privately operating universities. In Korça, there is also a state run university.

6.15.3 Health

The health services are based on poly-clinics and hospitals. In general the centres for urgent health services are located within the commune centres. The health service is also state and privately based. State institutions generally treat those with health insurance (i.e. state employees and families) while other members of the population must pay for treatment. Health insurance in the private facilities does not function well and can only be accessed by those that can afford it.

The following Table 6-18 provides details of the number of health institutions within the district.

Table 6-18: Health Facilities within the Districts

District	Fier	Kukes	Lushnje	Berat	Korça
Total Number of Health Facilities in District	**291**	**25**	**300**	**291**	**330**
In Urban Areas	33	11	20	33	23
In Rural Areas	258	14	280	258	317
Ambulances urban	No data	8	12	14	0
Ambulances rural	No data	0	65	110	85

More details on health facilities are contained in Annex E.

6.15.4 Currency

The money used in all Albanian territories is the Albanian LEK (ALL). The current currency range with the United States Dollar is 1 USD = 105 LEK.

6.16 Land Tenure and Land Use

The land tenure is divided into state lands and private lands. In the agricultural areas, the private land is generally inherited. Nevertheless under Albanian law, most of the owners of the period before World War II are considered legal owners only for a part of their inherited land. The other lands, or occupied agricultural lands are distributed to the farmers.
Between the years 1990-2000, much state or private lands were occupied by illegal developers or families that had no legal claim of hereditary entitlement. Many laws were adapted to regulate this situation and to avoid social conflicts. This process until now is not proceeding satisfactorily and hence land ownership is quite a complicated issue, especially in the cities. In the rural areas, this situation appears better, as most of the owners have a hereditary claim to their land.

Land use, is quite relative to land tenure. The land use of the state or private lands can be decided by the land owners (i.e. State or Private), but only after approval of the intended use from the state authorities. Most of the agriculture lands are used by private farmers. Also a part of forests is privatized, or provided for use to the village community. Notwithstanding, the specific sites, like protected areas, reservoirs, rivers etc are all state owned, but can be offered or used with a concession to private developers. Details of land use within the districts are shown in Table 6-19.

Table 6-19: Land Use within the Districts

Nr	Emërtimi / Name	Njësia e Matjes / Unit	Fier	Kukes	Lushnje	Berat	Korce
1	Sipërfaqe gjithsej / Total area	ha	**79406**	**66480.6**	**71239**	**93888**	**137369**
a	Nga: - Sipërfaqe bujqësore / From which: agriculture area	ha	52591.8	11415.6	51109	35324	
2	Sipërfaqe bujqësore e përdorur / Agriculture area in use	ha	46232.3		51109	28746	52390
	Nga: - Bimët e arave / From which: - field crops	ha	38912.5	4909	45887	19493	26533

Nr	Emërtimi / Name	Njësia e Matjes / Unit	Fier	Kukes	Lushnje	Berat	Korce
	- Kulturat drufrutore / -tree crops	ha	7319.8	1150.7	5222	9253	2253
b	Livadhe e kullota / meadows and pastures	ha	618	14505	440	8183	23604
c	Pyje +truall / woods + lands	ha	7100	40560	4563	29620	54900
d	Toke jo bujqesore / non-agricultural land	ha	6359.5	1024.6	1276	20761	30079
3	NR tapive te ndara / number of land patents distributed	Cope / unit		3419.9	13849	19670	0

6.17 Agricultural Production

This section describes the products on crops and vegetables, fruit trees, livestock etc., for the districts of Fier, Berat, Korça and Kukes. In general the production of agricultural lands will increase over the next few years, but there are factors which will hinder this development. The low income levels and poverty of the rural population reduces the use of fertilizers and pesticides. This on the one hand is good for the environment as it prevents excessive water pollution, but on the other hand, production quality and quantity is reduced.

The malfunction or immobility of irrigation reservoirs and canals is also influencing a reduction of agricultural products. Furthermore, problems of climatic change and malfunction of draining channels has created problems of flooding of agricultural lands during extreme rainfall events.

The Albanian government is trying to restore all irrigation and draining system, to save farm assets and crop production and to improve the standard of living in the communities, using the agriculture activity as a powerful development instrument.

6.17.1 Crop Types

Within the areas of the irrigation schemes and reservoirs, the most popular crops are forages and alfalfa or lucerne, with wheat grown in winter and spring, and maize grown in the summer. Small lands or gardens are planted with vegetables. Beans and hay are grown also in Kukes district. There are a lot of fruit tree plantations in Korça, Fier and Lushnje and Berat with apples, cherry, plum, pear, fig, olive trees, oranges and vineyards. Issues on crop patterns has been included in the questionnaire and will be elaborated in the social impact assessment.

In the low lying areas (i.e. Fier and Berat Districts), the total planted surfaces are dominated by forages 42-45%, with Lucerne more than 90% of this. Vegetables, maize, olive trees, vineyards and fruit trees are also cultivated in these areas. The greenhouse surface area in these districts is increasing and these predominantly grow fruit and vegetables primarily intended to supply the market all year round; resulting in an increase in revenue for the farmers. Significant amounts for forages and alfalfa are grown for livestock and this represents more than half of the cropped area of all the schemes (see Table 6-20).

Table 6-20: Aggregated Structure of Cropped Area within all Schemes

Crop Type	Average	Aggregated total cropped area (hectares)
Wheat	15%	12,567
Maize	10%	4,855
Potatoes	1%	463
Beans	3%	1,419
Tobacco	0%	20
Vegetables	6%	3,893

Crop Type	Average	Aggregated total cropped area (hectares)
Forages	31%	13,884
Alfalfa	22%	11,949
Fruit trees	3%	698
Apples	1%	72
Pastures	2%	139
Olive tree	3%	2,395
Vineyards	2%	739
Oranges	0%	14

Source: Adapted from Mott MacDonald Feasibility Study – data collected by Regional Directorate of Agricultural Food and Consumer Protection, Irrigation Board, Communes and Consultant

6.17.2 Crop Patterns and Crop Yields

Details of the Crop Patterns within the 14 irrigation schemes being investigated are shown in Table 6-21 below. As the I&D schemes are in poor condition, the yield of the crops of cereals and green vegetables and green forages is around 30-50% less than what the maximum yield could be. This has caused the farmers to increase the use of wells to supplement their water supply for drop requirements. More details crop and fruit tree production are contained in Annex E.

Table 6-21: Current crop pattern and intensity within all Schemes

Crop Type	T'Plan	Vranisht 2	Tregtan 2	Tregtan 3	Murriz Thana	Kurjan and Strum	Zharrez	Slanica	Belesova	Duhanas	Staravecke	Leminoti	Koshnice 1
Wheat	0.4%	13.2%	13.5%	12.2%	26.3%	18.3%	21.2%	9.6%	11.3%	14.5%	16.7%	19.3%	21.1%
Maize	12.7%	9.9%	10.8%	15.9%	9.6%	5.2%	9.3%	6.0%	13.8%	8.7%	11.1%	9.7%	8.2%
Potatoes	0.2%	1.6%	0.0%	1.2%	0.8%	0.7%	2.0%	2.2%	0.3%	1.4%	2.2%	5.0%	1.5%
Beans	0.0%	2.6%	8.1%	1.2%	3.0%	1.4%	1.3%	1.2%	1.8%	1.2%	5.6%	2.9%	6.7%
Tobacco	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Vegetables	2.2%	4.9%	8.1%	2.4%	8.6%	2.8%	14.9%	6.0%	2.3%	4.3%	11.1%	7.7%	4.3%
Forages	49.6%	29.6%	29.7%	40.2%	23.3%	36.0%	24.3%	35.4%	34.6%	25.4%	23.3%	26.8%	26.1%
Alfalfa	6.2%	26.3%	21.6%	22.0%	21.0%	30.6%	21.2%	27.7%	27.7%	20.3%	16.7%	21.2%	21.1%
Fruit trees	0.8%	7.6%	5.4%	3.2%	1.2%	0.3%	0.3%	1.2%	1.3%	6.1%	3.3%	3.9%	6.1%
Apples	0.2%	2.3%	2.7%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%	4.4%
Pastures	27.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Olive tree	0.0%	0.0%	0.0%	0.0%	4.8%	3.7%	3.4%	6.7%	5.6%	14.5%	5.6%	0.0%	0.0%
Vineyards	0.0%	2.0%	0.0%	0.5%	1.5%	0.8%	2.1%	3.9%	1.4%	3.6%	4.4%	1.9%	0.7%
Oranges	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cropping Intensity	**84%**	**140%**	**132%**	**130%**	**98%**	**65%**	**37%**	**130%**	**138%**	**125%**	**113%**	**33%**	**78%**

Source: Adapted from Mott MacDonald Feasibility Study

All dry forage including wheat straw, alfalfa, hay, maize stover (coarse fodder) and dry grass is stored in conical haystacks usually located near the farm houses and not adjacent to the I&D areas. Corn cobs are often stored in roofed, wire sided stores above ground also located at farmhouse sites. As most fodder is consumed directly from the stacks by livestock that pull the fodder from the base; forage is rarely baled and always stored loose in stacks. Wastage occurs through this feeding process and from weathering of the outer layer of the stack.

Silage is produced by the controlled fermentation of a crop with high moisture content. The fermentation process is controlled either by encouraging lactic acid formation by bacteria present on the fresh herbage, or by direct addition of a weak acidic solution or by preservatives such as sodium meta-bisulphite. The process is not popular in many countries, because of the difficulty in handling the strong acids at the time of ensiling (preserving). With the development of the forage harvester and the introduction of plastic con-

tainers, handling acids has become less of a problem and in recent years interest in the addition of acids has increased. A wide variety of crops may be preserved by ensiling. These include; grass, grass-clover mixture, legumes, greens, cereals, kale, root tops, sugar beet pulp, potatoes and fruit residues. Grass however, is the commonest crop to be made into silage.

6.17.3 Crop water requirements

The current crop water requirements for the various I&D schemes is shown in Table 6-22 below.

Table 6-22: Current crop pattern and intensity within all Schemes

Scheme irrigation water requirements m^3/hectare	T'Plan Vranisht 2 Tregtan 2 Tregtan	Murriz Thana Kurjan & Strum Zharrez	Slanica, Belesova, Duhanas	Staravecke	Leminoti	Koshnica 1
Grure /Wheat	1700	1700	1300	1300	1700	1600
Miser /Maize	4500	4500	5300	5300	4500	3600
Patate /Potatoes	0	3000	3400	3400	0	3100
Fasule/White beans	0	3000	3400	3400	0	4000
Duhan/Tabacco	0	3000	3400	3400	0	2100
Perime/Vegetable	5200	5200	3400	3400	5200	4000
Foragjere/Forage	3700	3700	4200	4200	3700	3000
Jonxhe/Alfalfa	5200	5200	5700	5700	5200	4000
Peme/FruitTrees	2800	1500	3300	3300	2800	2800
Molle/Apples	2800	1500	3300	3300	2800	2800
Livadhe/Pastures	500	500	500	500	500	500
Ullinj/Olive trees	0	800	2800	2800	0	0
Hardhi /Vineyards	2800	800	3300	3300	2800	2800
Agrume/Citrus	0	1500	5400	5400	0	0

Source: Adapted from Mott MacDonald Feasibility Study

6.17.4 Pests and Crop Diseases

Among the diseases of agricultural plants and pests found on the farms surrounding the different project sites are:

- Potato blight - *Phytophthora infestans*
- Tomato/pepper/cucumber blight - *Phytophthora caspici*
- Cereal rust- *Puccinia Graminis*,
- Grapevine mildew - *Plasmopora viticola*
- Botrytis bunch rot – grey mould - *botrytis cinerea* – affecting fruit
- Powdery mildew - *Erysiphe Graminis*,
- Apple scab disease - *Venturia Inaqualis*
- Blue mould - *Penicillium Expansum*
- *Fusarium* Wilt affecting tomatoes
- Olive scab/olive leaf spot or peacock spot - *Spilocea oleagina*

Pests include

- Various *Lepidoptera* (moths and butterflies)
- Plant louse and other aphids of the homopterous family *Psyllidae* (or *Chermidae)*
- Wood louse or Woodlice form the suborder *Oniscidea* within the order *Isopoda*
- Chafer or beetles living on many plants and crops.

For animal diseases, the pseudo - *pestis avium* (Poultry Plague) of chickens, *Coccidiosis* (Eimera sp.), Ovine Brucellosis (*brucella militensis*) etc. are the most common found on farms within the project areas.

No serious human illness passed from animals such as tuberculosis, bird flu etc. have been recorded within any of the farms in the project areas.

6.17.5 Fertiliser and Pesticide use

Albania does not use fertilisers like it used to do, which has resulted in a reduction of soil organic content (nitrogen, phosphorous and potassium – NPK) compared to 20 years ago. Wasteful and improper cultivation and poor soil conservation practices have also caused soil degradation. Before 1990, 150-160kg/ha of active matter (NPK) and 8 tons/ha/year of organic manure was added to fertilise arable lands. After 1990, statistical data shows that 70-80kg/ha/year of NPK chemical fertiliser was used and only 1.6 ton/ha/year of organic manure.

The main fertilisers used are di-ammonia phosphate (DAP), "nitrate" and urea which are mainly sourced locally together with crop protection chemicals (i.e. pesticides). Furthermore, fertiliser application is haphazard; potassium fertiliser is normally required as indicated by previous soil analyses, but is not used. Nitrogen is used on alfalfa, but this is not normally required. Generally speaking applications are made in a random fashion without any up to date knowledge of individual field fertility status.

Similarly, a considerable range of crop protection chemicals (pesticides) are observed to be available (refer to Annex A2 of this ESFD) but again application appears to be made haphazardly; with the exact nature, target crops and methodology of usage not known. [17]

The main source of data for obtaining the fertiliser and pesticide application rates is the Statistical Yearbook from 2011 published by MAFCP ("Vjetari" 2011). The statistical information given for the amount (in kg) of Chemical Fertilisers and Pesticides used per farm, in regions of Kukes, Fier, Berat and Korça is shown in Table 6-23 below.

Table 6-23: Average amounts of Chemical Fertiliser and Pesticide Use by District (kv/farm)

Region	District	Normal amount of Chemical Fertilisers used (kv/farm)				Pesticides used kv/farm
		UREA	Ammonium Nitrate	DAP	Other	
KUKES	Tropoja	0.04	0.08	0.04	0.06	0.008
	Has					
FIER	Lushnje	0.18	0.14	0.13	0.13	0.021
	Fier					
BERAT	Berat	0.15	0.01	0.13	0.01	0.024
	Skrapar					
KORCE	Korça	0.07	0.13	0.08	-	0.014
	Devoll					

Source: Adapted from Mott MacDonald Feasibility Study

By using the average amounts of fertilisers and pesticides used per district, and the number of farms in each scheme area, the average amount used in each scheme area can be calculated as shown in Table 6-24

Table 6-24: Chemical and Pesticide Use per I&D Scheme (kv)

Region	No of Farms	Dam and I&D Scheme	Chemical Fertiliser Used				Pesticides used (kv)
			UREA (kv)	Ammonium Nitrate (kv)	DAP (kv)	Other (kv)	

[17] Historically during the central economy period, Albania used to manufacture pesticides. For example, the chemical plant in Durrës produced sodium tri-chromate, lindane and thiram pesticides up until 1990 when it closed down. However it left behind a very large quantity of waste containing chromium and the adjacent land was contaminated by pesticides which in turn contaminated groundwater. This site was identified as a hotspot and has been cleaned up under an EU project. It is also estimated that more than 1,000 tons of obsolete (expired) pesticides have been accumulated in the agricultural sector lying around unprotected in the many small farms in environmentally unsatisfactory conditions and pose a threat to the population and the environment in general.

Region	No of Farms	Dam and I&D Scheme	Chemical Fertiliser Used				Pesticides used (kv)
			UREA (kv)	Ammonium Nitrate (kv)	DAP (kv)	Other (kv)	
	600	T'Plan	24	48	24	36	5
	180	Vranisht 2	7	14	7	11	1
	275	Tregtan 2	11	22	11	17	2
	165	Tregtan 3	7	13	7	10	1
	23226	Murriz Thana	4,181	3,252	3,019	3,019	488
	8373	Kurjan & Strum	1,507	1,172	1,088	1,088	176
	1678	Zharrez	302	235	218	218	35
	2550	Slanica	383	26	332	26	61
	1470	Belesova	221	15	191	15	35
	1080	Duhanas	162	11	140	11	26
	320	Staravecke	48	3	42	3	8
	1141	Leminot	80	148	91	-	16
	912	Koshnica 1	64	119	73	-	13

Source: Adapted from Mott MacDonald Feasibility Study

As seen in Table 6-24, there appears to be an under-use of agricultural chemicals and pesticides. Overall use of fertilisers is well under half of what was used previously in 1990, with soil fertility being "mined" in most areas. By increasing the use of fertilisers to recommended levels and rendering the suggested practices, incomes from farming are likely to increase and this will improve the long-term sustainability of the schemes.

Furthermore, the use of fertilisers will positively affect the development of beneficial soil micro-organisms and will enrich the soil with microelements. This will also lead to an improvement in the quality of water carrying soil and influence the environment with CO_2 enrichment.

According to the data collected in the intensive agricultural areas of the Fier and Berat schemes; chemical fertilisers are used on vegetables and fruit trees. The average amount of chemical fertilisers applied in these schemes is 6 kv/ha. Nearly double that used in the Tropoja scheme, where about 3-4kv /ha is used.

Consequently, use of pesticides can be very harmful if not applied properly and they need to be managed and monitored effectively. The environmental safeguard OP4.09 on Pest Management is triggered on WRIP because the improvement of irrigation schemes will lead to growth of intensified agriculture which could be associated with increased use of agrochemicals including pesticides (that are currently used at very low levels).

The MAFCP is one of the authorities that are responsible for IPM in Albania; collaborating with MEFWA, Ministry of Health, etc. MAFCP is responsible for policies and strategies relating to pesticides, the National Food Agency (NFA) is responsible for monitoring and the Institute for Food Safety (IFS) and Veterinary is responsible for analysis of Pesticides, the IFS lab, with a staff of 4 persons began operating 5 years ago and undertakes monitoring of the level of pesticides on food. The capacity of MAFCP and its dependents (NFA and IFS) was considered appropriate. The need for Albania to become compliant with EU candidature poses fresh challenges and these are expected to be address in a more comprehensive IPM strategy in 2014 (See Annex A1).

The Institute for Public Health which is responsible for monitoring drinking water quality in Albania has limited resources for monitoring for pesticides. Data has been obtained however from Lushnje and Fier districts that shows that pesticides have not been detected in any water sources monitored in these two

districts during 2010 and 2011. In addition, the newly created NFA and IFS (through EU IPA funding) with its established regional inspectorates and laboratories under MAFCP has responsibility among other things for monitoring pesticides in food products (i.e. milk, fruit, vegetables etc.) but will need time for it to become fully functional.

Notwithstanding, the current haphazard approach to pesticide use, the abandoned and expired pesticide stocks, combined with poor knowledge of application practice implies substantial need for raising awareness to an integrated pesticide management (IPM) approach within the I&D schemes. MAFCP together with the associated drainage boards, WUAs and WUOs need to strengthen their internal capacity related to pest management and the application of pesticides especially now in relation to planned EU accession.

Besides this new PPP strategy mentioned above, GOA intends further to emulate the strategy of the relatively new EU Framework Directive on Sustainable Pest Management which requires at its heart an IPM approach. This needs to include training to farmers, DBs etc. in the risks and hazards and safe practices for handling, storing, using and disposal of pesticides, and also in sustainable pest management based on an IPM approach. Training of farmers in this regard will be provided through the MAFCP. Provisions for this training need to be described in the Site Specific ESMPs for the I&D schemes, but will include such issues as: . IPM strategies and techniques, integrated crop management strategies and techniques, organic farming principles, biological pest control methods, information on the general principles and crop or sector-specific guidelines for IPM. A further outline of the training curriculum is indicated in Chapter 11(Section 11.1).

6.18 Livestock

In the Murriz Thana, Kurjan, Zharrez, Slanica, Belesova and Duhanas areas, livestock dominates, with dairy cows accounting for around 90% of the bovine structure. At these sites the dairy yield is around 2500-3000 litre/head per year. In such areas poultry farms are also common with average yield of 1.6-2 kg/head. In Belesova and Duhanas areas the average dairy yield is 1200-1300 litre/head. The yield from goats and sheep is around 60-65 litre/head. In the Leminot and Koshnica areas, dairy cows dominate, followed by sheep and then goats. There are about 6000 sheep and goats with a dairy yield of around 50-80 litre/head. The milking yield for dairy cows is 1350 liter/head lactation. In Koshnica there are about 300 pigs.

Intensive livestock farming is not practised in any of the project areas under the study; further herd or flock sizes are small; hence the risk of nitrate contamination from faeces and animal evacuations through runoff into rivers and then into the reservoirs is negligible.

6.19 Cultural Monuments

There are no existing cultural or archaeological sites of interest that will be affected at any of the dam, reservoir and I&D schemes. However, relevant procedures and mitigation measures for dealing with archaeological chance finds are included within the site specific ESMPs for the dam safety and I&D rehabilitation projects.

6.20 Roads

The condition of the roads in rural areas is a very important issue for the residents that live there. Many of the reservoir sites are located along very poor roads that are not maintained. The following Table 6-25 provide indications for the travelling times from Tirana, the capital, to the district centres and Table 6-26 provides indications of the time and condition of the roads from the district centres to the villages/reservoir sites.

Table 6-25: Travelling time from Capital city to District centres

FROM	→	TO	ROAD DETAILS

Capital City	Kms by road	Total minutes	Main/ District Centres	Road type	Condition
Tirana	143	121	Kukes	Asphalt	Excellent
Tirana	218	183	Tropoja	Asphalt	Good/Fair
Tirana	212	177	Bajram Curri	Asphalt	Good/Fair
Tirana	112	82	Fier	Asphalt	Excellent
Tirana	86	63	Lushnje	Asphalt	Excellent
Tirana	180	150	Korça	Asphalt	Excellent
Tirana	125	99	Berat	Asphalt	Good
Tirana	176	145	Skrapare	Asphalt partially	Good /Fair

Table 6-26: Travelling time from District centres to village/reservoir/I&D sites

FROM			TO	ROAD DETAILS	
Main/ District Centres	Kms by road	Total minutes	Commune/ Villages/ dams	Road type	Condition
Kukes	26	46	Vranisht/reservoirs	Asphalt (only for 5 km)/dirt	Poor
Bajram Curri	12	20	T'Plan	Asphalt	Good (Poor from the main road to the reservoir)
Fierza Commune	15.5	40	T'Plan	Bad Asphalt/dirt	Fair
Fier	14	30	Zharrez reservoir	Asphalt/dirt	Fair
Kukes	21	50	Vranisht reservoir	Asphalt(only 5 km)/dirt	Very Poor
Kukes	15.5	35	Tregtan 3	Asphalt(only 5 km)/dirt	Poor/Very poor
Kukes	15	30	Tregtan 2	Asphalt(only 5 km)/dirt	Poor/Very poor
Lushnje	43	43	Murriz Thana reservoir	Asphalt/dirt	Fair
Fier	21.7	38	Kurjan	Asphalt/dirt	Fair
Fier	18.5	30	Strum	Asphalt/dirt	Fair
Fier	12.5	15	Zharrez	Asphalt/dirt	Fair
Korça	23	26	Pirg (Leminot centre)	Asphalt partially	Fair/Appropriate
Korça	25	30	Leminot reservoir	Asphalt partially	Fair/Appropriate
Korça	43.4	45	Miras (Koshnica centre)	Asphalt partially	Fair/Appropriate
Korça	40	40	Koshnica reservoir	Asphalt partially	Fair/Appropriate
Berat	52.3	49	Skrapare	Asphalt/dirt	Fair/Poor
Skrapare	70.2	66	Kutalli (Staravecke)	Asphalt/dirt	Fair
Berat	19.8	20	Kutalli	Asphalt/dirt	Fair
Berat	8.5	10	Duhanas	Asphalt/dirt	Fair
Berat	23	25	Belesova	Asphalt/dirt	Fair

The proposed project works for the dam and I&D schemes rehabilitation have a small inclusion for road repair at sites that are particularly bad for gaining access (e.g. Staravecke). However, the project will not be upgrading all local roads within the communes. Nonetheless, there are some separate projects on-going in the vicinity of the sites (i.e. the Albanian Development Fund projects) that are improving local roads. It is therefore important that the proposed works on the dam and I&D schemes rehabilitation takes into account these issues in the scheduling of the construction works.

6.21 Other Infrastructure

Around half of the villages associated with the dam and I&D schemes have sewer network for wastewater

while the residents of the remaining villages use septic tanks. There are no wastewater treatment plants in use.

The water supply for the villages in the project areas come from a combination of protected natural springs or are supplied by water utility companies within a piped network.

In the vicinity of Zharrez there are underground and surface pipelines carrying oil or other hydrocarbon products.

All electricity is provided by a high tension electricity grid and the complete network is overhead by means of pylons and poles.

6.22 Industry

With the exception of Zharrez, none of the dam and I&D schemes have heavy scale industry in the near vicinity. Most industries are minor including small dairies, saw mills, flour mills, small scale commercial fisheries, and numerous hardware shops, restaurants, bars and cafes.

7 ENVIRONMENTAL IMPACTS

The chapter identifies potential environmental impacts; however in the ESFD the impacts are considered in principle and are screened overall, because the detailed categorization and detailed assessment is done at the site specific level.

It should also be noted that this ESFD covers all types of potential situations and subsequent mitigation measures outlined in the ESFD may not apply in all cases.

The environmental impacts for the restoration and rehabilitation of the 14 dams, reservoirs and I&D schemes under the study, can be classified in positive and negative impacts. On those two main groups, the Consultant has considered also the spatial impacts, indirect impacts, direct ones etc. After categorization of impacts, the consultant has weighted and ranked them, selecting potential and accumulative ones.

The impacts are considered at two main steps, at the construction and at the operation phases. To define the overall environmental, safeguard and social negative impacts the WB model of impact checklists has been used.

As previously mentioned, at this stage of the project, the Consultant has based his assessment mostly on existing information sources, and specific studies related to the sites, as well as field surveys to complete the general view of overall effects of the project implementation.

The environmental impacts chapter (section 10) refers to the overall impacts that will be the framework for the site specific ESMPs. In this part of the study the positive and negative impacts are classified and ranked, opening the opportunity, to evaluate the benefits by project implementation and mitigate negative ones.

7.1 Positive Environmental Impacts

The project intends to improve the irrigation capacity in the 13 reservoirs (Strum and Kurjan dams share the same reservoir) and related I&D schemes, during a critical economic period of the Albanian economy. Agriculture remains the most important economic activity in Albania in general and especially within the regions of Lushnje, Fier, Berat, Korça and Kukes, where the reservoirs and I&D schemes are located. Such a project is urgently required to increase agricultural productivity and to improve the livelihoods of the people living within the areas covered by the irrigation schemes.

Rehabilitation of reservoirs, followed by revitalization of irrigation channels, will ensure improvement of agriculture production, based on vegetation and plant production that will increase the agriculture soil stability, reduce erosion, create permanent habitats with seasonal features, that create appropriate habitats not only for specific indigenous fauna (with protection status) but also for migratory species almost threatened or protected in European or at global level. In the following Table 7-1 the types of positive impacts are considered for each phase and their efficiency/effects in time and space.

Table 7-1: Screening of Positive Environmental Impacts

Types of Positive impacts	Construction phase	Operation phase	Spatial Efficiency	Impact duration
Flood control	Not considerable	Very important	Saving of human life and assets	Long Term
Increase the intensive green cover	Not active	Very important	Create agricultural plant habitats in large areas for ¾ period of year	Long Term

Types of Positive impacts	Construction phase	Operation phase	Spatial Efficiency	Impact duration
Reduce erosion activity by compacting the soils and fixing the soil layer by plant roots	Not active	Very important	1.Create agricultural plant habitats in large areas for ¾ period of year 2.Reduce water(also river) and soil pollution by reducing sediment transport and disposal 3. Protect/Save Agricultural Land	Long Term
Impacts to human health	Not considerable	Increasing of health safety by possible contamination coming from sediment transport	Positive effects to all lowland and downstream people where eroded sediment is transported by waters	Long term
Impacts on wildlife	Not positive impacts	Safety of specific fauna from possible contamination during sediment transport	Positive effects to all lowland and downstream wildlife where eroded sediment is transported by waters	Long term
Conservation of fish and wildlife	Not positive	Very important	Conservation of fish and wildlife in command area and associated rivers due to establishment of habitat protection and fishery management mechanisms and increased environmental awareness	Long term
Ecosystem Restoration	Not positive	Very important	Restoration of wetland ecosystem functions adjacent to command area (if they are present)	Long term

The table above is related only to ecological/environmental impacts. The social and economic impacts are discussed in the next chapter. Together with the social and economic positive impacts it will be possible to see clearly the total effects of the project implementation.

From Table 7-1: Screening of Positive Environmental Impacts above it can be seen that the positive effects of the reservoir and dam rehabilitation works will be most pronounced during the operation phase when the people downstream will enjoy better flood control, increased cropping intensities, increased crop yields and diversity, better drainage, there will be less sediment transport and the plant habitats will be improved by a regular irrigated supply. During the construction phase there are generally limited positive effects on the environment and health, and in general impacts would be negative, but this would be for a short periods (most construction periods are anticipated to be no more than 3 to 4 months.

7.2 Negative Environmental impacts

The possible negative impacts are classified and screened having taken into account horizontal and vertical effects, the impact phase, duration of impacts, their potential etc., thus creating a better framework for mitigation measures and the monitoring plan. The following Table 7-2 presented the screening of negative environmental impacts providing a weighting and impact duration.

Table 7-2: Screening of Negative Environmental Impacts

Impact sources	Type of possible impact	Project phase	Impact weight	Negative impact effects on the environmental elements	Impact Duration
Reduction of irrigation capacity during rehabilitation works	Limited irrigation water in the dry season	Construction	High	Zero or limited products	Medium Term Temporary impact
Disposal of the building materials	Noises and air pollution (p.M.[10]), risk of life by accidents Damage of surrounding green areas or reservoir waters	Construction	Moderate	Damage to green areas in the operational site and vegetation in the back or crests of Dams. Damage to garden of pumping station Increase sedimentation in the outlet channel	Medium Term Temporary' impact

Impact sources	Type of possible impact	Project phase	Impact weight	Negative impact effects on the environmental elements	Impact Duration
Treatment works in the working places	Noise, vibration by compacting and treatment activities etc. Damaging or destruction of trees and grass cover	Construction	Moderate to High impact – depend on equipment, working techniques, and status of the working space	Disturbance and health problems to workers and inhabitants during construction phase Reduce green cover and soil compaction	Medium Term Temporary impact
Transport of materials from the source area to the working place	Air pollution by noises and particle matters, vibration by huge transport vehicles Increase of intensity of transport (risk of accidents) Wildlife risk	Construction	Moderate	1. Negative impact transfer to other areas. Health/visual issues 2. Risk of accidents 3. Road damage 4. accidents to wildlife or wildlife disturbance	Medium Term Temporary impact
Opening of the new road or enlarging existing ones	Tree cutting, reducing of green areas.	Construction	Moderate	Destroying habitats (vegetation and soils) and threat of wildlife	Medium Term Temporary impact
Exploitation of raw material (gravel and sand) in un appropriate source places for construction purposes	Overexploitation of river bottom or mountain/hilly slopes	Operation	High	Destruction of river bodies and specific habitats, inciting erosion, artificial/man made erosion in river bad (cumulative impact)	Long Term
Accidents of workers or inhabitants during the works	Risk of life	Construction	Very high	Accidental failure, crush by car movements or mismanagement of equipment	Medium Term Temporary impact
Un-controlled generation of solid wastes, un cleaned toilet, missing of bath possibilities etc.	Risk of contamination and visual disturbance by remaining of work materials, used water dispersion, solid wastes generated by workers etc.	Construction	High/ Moderate	Visual disturbance, dispersion of contamination/ health risk	Medium Term Temporary impact
Decrease the reservoir depth by sediments or other solids generated during works.	Reduce the irrigation capacity and feeling of discharge channels/spillways with sediments	Construction	High	Decrease the efficiency of investment. Flood Risk Reduce fish numbers	Medium Term Temporary impact
Reduce water reservoir volume for construction purposes	Decrease fishing capacity of reservoir	Construction	High/Medium	Decrease fish farm or incomes from fisheries	Medium Term Temporary impact
Disruption of access to irrigation canals and drains	Prevented from attending crops	Construction	Medium	Loss of crop production	Short term
Inappropriate quality of irrigation waters	Increasing of contamination risk and/or damage in lowland areas in case of non appropriate quality of irrigation waters	Operation	High	Impact transfer in other areas and affect to rivers, coastal waters and other areas with specific values (Protected Areas etc)	Long Term
Accidental Overflows from Dams	Damage and risk the human life and assets	Operation	High	Risk for floods	Short term
Secondary salinization of soils	Fall in Crop production	Operation	High	Leads to irreversible decline in soil quality and soil structure	Long term

Impact sources	Type of possible impact	Project phase	Impact weight	Negative impact effects on the environmental elements	Impact Duration
Soil Salinity	Contamination of the groundwater	Operation	High	Contaminates ground-water sources that may be used for human con-sumption	Long term
Erosion and sedimentation	Can destroy land and prevents crop growth	Operation	High	Prevents access to sites and potentially affects crop production	Medium to Long term
Water quality of irri-gated return flows	Biological and ecological impacts	Operation	High	Loss of biodiversity	Medium to Long term
Earthquakes	Destruction of dam and other infrastructure Loss of life	Operation	High	Creates devastation and economic hardship	Short - Medium
Overuse of natural and chemical fertilisers	High nutrient level can contaminate water sup-plies	Operation	High	Can become toxic to aquatic life, can enter the food chain and be-come danger to health	Long term
Overuse of pesticides or use of banned sub-stances	Runoff can lead to con-tamination of natural water supplies	Operation	High	Can upset aquatic biota-ecosystems, can lead to eutrophication and be-come a danger to health	Long term
Misuse of Pesticides	Exposure of farm workers and farm animals to haz-ardous products	Operation	High	Can also affect non-target organisms in the ecosystem (i.e. birds natural enemies of crop pests)	Long term

As can be seen in the table above, the main negative impacts tend to occur during the construction phase. However, during the operation phase there is potential for impact from a number of sources such as soil salinization, contamination of groundwater and non-appropriate water quality flowing into irrigation channels which is a potential long term concern, with cumulative characteristics. Furthermore overuse of pesticides and fertilisers can have serious consequences for aquatic life, can lead to eutrophication and if unchecked for long enough can enter the food chain and be a danger for health. The misuse of pesticide can represent a direct hazard to famers/farm workers and farm animals which in turn can affect target organisms in the ecosystem such as birds which are the natural predators for many crop pests. Hence, in the ESFD these impacts will be considered as priority with focus on the plan for mitigation measures including training and a monitoring program. Full provisions for the training will be described in the site specific ESMPs for the I&D schemes.

7.3 Main environmental issues affecting irrigation

For the WRIP to be successful it is important to maintain the existing I&D systems that are to be rehabilitated, to sustain water distribution and maintenance systems, and to establish incentives for efficient water use. However, irrigation has a number of negative impacts that need to be addressed:

7.3.1 Low flow regimes

Where irrigation schemes are associated with perennial stream and rivers, changes to the low flow regime may have significant negative impacts on downstream users, whether they abstract water (irrigation schemes, drinking supplies) or use the river for transportation or hydropower. Issues to consider are:

- Minimum demands from both existing and potential future users need to be clearly identified and assessed in relation to current and future low flows. The quality of low flows is also important.
- Return flows are likely to have significant quantities of pollutants. Low flows need to be high enough to ensure sufficient dilution of pollutants discharged from irrigation schemes and other sources such as industry and urban areas. A reduction in the natural river flow together with a discharge of lower

quality drainage water can have severe negative impacts on downstream users, including irrigation schemes.

- Habitats both within and alongside rivers are particularly rich, often supporting a high diversity of species. Large changes to low flows (±20%) will alter micro-habitats of which wetlands are a special case. It is particularly important to identify any endangered species and determine the impact of any changes on their survival. Such species are often endangered because of their restrictive ecological requirements.

Mitigation measure

Integrating low flow release strategies into irrigation dam operation protocols or management plans is the best mechanism for mitigating the potential negative impacts of changes to low flows.

7.3.2 Flood and sediment transport regimes

Uncontrolled floods can cause tremendous damage and flood control is therefore often an added social and environmental benefit of reservoirs built to supply irrigation water. It is important that new or rehabilitated irrigation infrastructure does not adversely affect the natural drainage pattern, thus causing localized flooding. Radically altered flood regimes may have negative impacts; for example:

- Any disruption to flood recession agriculture needs to be studied as it is often highly productive but may have low visibility due to the migratory nature of the farmers practicing it. Flood waters are important for fisheries both in rivers and particularly in estuaries. Floods trigger spawning and migration and carry nutrients to coastal waters.
- Controlled floods may result in a reduction of groundwater recharge via flood plains and a loss of seasonal or permanent wetlands.
- Changes to the river morphology may result because of changes to the sediment transport regime of flood waters. This may be either a positive or negative impact, as dams typically interrupt the natural sediment transport regime and can cause downstream scour for many hundreds of kilometres; and
- Sediment accumulation in the reservoir can reduce the storage capacity and affect the operational life of the reservoir.

Mitigation measure

As with low flows, the operation of dams offers excellent opportunities to mitigate the potential negative impacts of changes to flood flows. The protection of flood plains may also be a useful measure as they function as groundwater recharge zones and also attenuate peak discharges downstream. These are additional positive functions of wetlands.

7.3.3 Fall or Rise of water table

Lowering the water table by provision of drainage to irrigation schemes with high water tables brings benefits to agriculture. Lowering the groundwater table by only a few metres adversely affects existing users of groundwater whether it is required for drinking water for humans and animals or to sustain plant life (particularly wetlands), especially at dry times of the year. Springs are fed by groundwater and will finally dry up if the level falls. Similarly low flows in rivers will be reduced. Any changing availability of groundwater for drinking water supply needs to be assessed in terms of the economics of viable alternatives. Poor people may be disproportionately disadvantaged. They may also be forced to use sources of water that carry health risks.

A number of negative consequences of a falling water table are irreversible and difficult to compensate for example salt water intrusion and land subsidence, and therefore groundwater abstraction needs controlling either by licensing, other legal interventions or economic disincentives.

In the long-term, one of the most frequent problems of irrigation schemes is the rise in the local water-

table (water logging). Low irrigation efficiencies (as low as 20 to 30% in some areas) are one of the main causes of rise of water table. Poor water distribution systems, poor main system management and archaic in-field irrigation practices are the main reason.

Mitigation measure
Good irrigation management, closely matching irrigation demands and supply, can reduce seepage and increase irrigation efficiency, thereby reducing groundwater recharge. The provision of drainage will alleviate the problem locally but may create problems if the disposal water is of a poor quality. Apart from measures to improve water management, two options to reduce seepage are to line canals in highly permeable areas and to design the irrigation infrastructure to reduce wastage. Water logging also implies increased health risks in many parts of the world.

7.3.4 Water quality and Agrochemical pollution

The changing hydrological regime associated with irrigation schemes may alter the capacity of the environment to assimilate water soluble pollution. In particular, reductions in low flows result in increased pollutant concentrations already discharged into the water course either from point sources, such as industry, irrigation drains and urban areas, or from non-point sources, such as agrochemicals leaking into groundwater and soil erosion. Reduced flood flows may remove beneficial flushing, and reservoirs may cause further concentration of pollutants.

A high nutrient level is essential for productive agriculture. However, the use of both natural and chemical fertilizers may result in an excess of nutrients which can cause problems in water bodies and to health. Intensive use of chemical fertilizers and insecticides/pesticides for the exploitation of the available land can lead to a proportion of the used fertilizers draining back to the surface and groundwater systems. The use of these sources for drinking water supply is at risk due to the presence of nitrogen and phosphorus salts. The run off of fertilizers and pesticides can also lead to eutrophication and upset aquatic biota and ecosystems

The misuse of pesticide can also represent a direct hazard to famers/farm workers and farm animals which in turn can affect target organisms in the ecosystem such as birds which are the natural predators for many crop pests. The old expired stocks of pesticides lying around many of the farms in Albania need to be secured to prevent their accidental use. Farmers need to be made aware of this fact.

Such high nutrient levels is toxic to some aquatic life and can encourage rapid rates of algae growth which tends to decrease the oxygen level of the water and thus lead to the suffocation of fish and other aquatic biota. Clear water enhances the effect as it enables increased photosynthesis to take place: reservoirs and slow-moving water are therefore most at risk. Some algae produce toxins, and if de-oxygenation is severe, eutrophic conditions occur.

Mitigation measure
Pesticides and chemicals used for agriculture must be assessed and monitored as part of the ESMP process, and measures to ensure compliance with the OP 4.09. The Site Specific ESMPs for I&D schemes need to highlight the actual measures that will be made for pesticide handling, use and management.

There should be awareness raising undertaken by MAFCP into IPM but also training to farmers/WUOs on the risks and hazards and safe practices for handling, storing, using and disposal of pesticides and also in sustainable pest management based on an IPM approach. Training and outreach to farmers in this regard will be provided through MAFCP. The provisions for this training need to be described in the Site Specific ESMP for I&D schemes.

7.3.5 Soil salinity

(a) Impact of soil salinity

The increased use of agro-chemicals, needed to retain productivity under intensification, can introduce toxic elements that occur in fertilizers and pesticides. On irrigated lands salinization is the major cause of land being lost to production and is one of the most prolific adverse environmental impacts associated with irrigation. The accumulation of salts in soils can lead to irreversible damage to soil structure essential for irrigation and crop production. Effects are most extreme in clay soils where the presence of sodium can bring about soil structural collapse. This makes growing conditions very poor, makes soils very difficult to work and prevents reclamation by leaching using standard techniques

Mitigation measure
Careful management can reduce the rate of salinity build up and minimize the effects on crops. Management strategies include: leaching; altering irrigation methods and schedules; installing sub-surface drainage; changing tillage techniques; adjusting crop patterns; and, incorporating soil ameliorates. All such actions, which may be very costly, would require careful study to determine their local suitability.

(b) Impact to groundwater
Any areas within the project areas associated with WRIP with underlying groundwater potential is significant. One of the main impacts associated with I&D projects is the potential for increases in soil salinity. This can result in an increase in the salinity of the groundwater which is often associated with water logging.

Mitigation measure
An appropriate and well-maintained drainage network will mitigate against such effects.

(c) Impacts from drainage
Areas with a flat topography or with water tables that have a low hydraulic gradient are at risk from salinization as are areas with soils of a low permeability which are difficult to leach. Groundwater drains, either through pipe (tile) drains or deep ditches, carry out the dual task of controlling the water table and through leaching, counteracting the build up of salts in the soil profile. Normally water is applied in excess of the crop water requirement and soluble salts are carried away in the drainage water.

Mitigation measure
Reducing salt inputs is one way of improving drain water quality. The safe disposal of salts is of prime importance, either to the sea (using dedicated channels if river quality is threatened and the sea is close enough) or to designated areas such as evaporation ponds where the negative impacts can be contained.

7.3.6 Erosion and sedimentation

Upstream erosion may result in the delivery of fertile sediments to delta areas. However, this gain is a measure of the loss of fertility of upstream eroded lands. A major negative impact of erosion and the associated transport of soil particles is the sedimentation of reservoirs and abstraction points downstream, such as irrigation intakes and pumping stations. De-silting intakes and irrigation canals is often the major annual maintenance cost on irrigation schemes. The increased sediment load is likely to change the river morphology which, together with the increased turbidity, will affect the downstream ecology

Soil erosion rates are greatest when vegetative cover is reduced and can be 10 to 100 times higher under agriculture compared with other land uses. However, there are a wide range of management and design techniques available to minimize and control erosion. For erosion to take place, soil particles need to be first dislodged and then transported by either wind or water.

Mitigation measures
Both actions can be prevented by erosion control techniques which disperse erosive energy and avoid concentrating it. For example, providing good vegetative cover will disperse the energy of rain drops and contour drainage will slow down surface runoff.

(a) Local erosion

The method of irrigation profoundly affects the vulnerability of the land to erosion. Because irrigated land is wetter, it is less able to absorb rainfall and runoff will therefore be higher. The prevalence of mountainous and undulating landscapes, coupled with the expansion of arable farming on steep areas and the logging of forested areas have aggravated the soil erosion problem in Albania. Soil erosion is a serious problem particularly in the WRIP project areas threatening the agricultural sector and causing increased sedimentation of reservoirs and lakes.

Field size, stream size (drop size), slope and field layout are all difficult to change and all significantly affect erosion rates. Careful design can avoid the occurrence of erosion problems. Agricultural practices affect soil structure and therefore the soil's erosivity, or the ease with which particles are dislodged. In general land-forming for irrigation, such as land-levelling and the construction of field bunds, tends to reduce erosion.

Archaic in-field water management practices involving poor cut and fill operations through watercourse embankments can result in serious local erosion at the head end of the irrigated field and in sedimentation at the mid or tail-end locations of the field. The micro-topography of a field will thus be disturbed. Unavoidably, this effect creates disproportionate water distribution over the irrigated field. In addition it might create disputes between water users. Improved water management practices related to surface irrigation methods (e.g. by using gates, siphons, check dams) can reduce such hazards.

Mitigation measures

Irrigation infrastructure needs to be designed to ensure that localized erosion, eg gully formation, does not occur. Construction activities generally expose soil to erosion. Following the completion of construction work, vegetation should be established around structures so that bare soil is not exposed to erosive forces.

(b) River morphology

Reductions in low flows and flood flows may significantly alter the river morphology, reducing the capacity to transport sediment and thereby causing a build up of sediments in slower moving reaches and possibly a shrinking of the main channel. Increasing flows will have the reverse effect. Where the sediment balance changes over a short distance, perhaps due to a reservoir or the flushing of a sediment control structure, major changes to the local river morphology are likely to occur. The release of clear water from reservoirs may result in scour and a general lowering of the bed level immediately downstream of the dam, the reverse of the effect that might be expected with a general reduction in flows. Changes to the river morphology may effect downstream users, in particular abstraction for industry and irrigation. The river ecology may also be adversely affected.

Mitigation measures

Changes to the sediment transport regime caused by dams or check dams are very difficult to mitigate. One possible technique is to periodically flush the reservoir by opening a bottom gate (this gate must be installed during construction such that its invert is close too the original invert of the stream channel, e.g., the lowest point of the channel) and allowing the accumulated sediment to wash out. This is best done on a regular basis and with flows sufficient to distribute the sediment fairly evenly downstream. If done irregularly, the released sediment can choke the channel, reducing channel capacity and causing localized flooding.

The most important mitigation measure is to determine a minimum flow (often termed an “environmental flow” or “ecological flow”), and assure that this minimum flow is maintained, especially during seasonal low flow periods. There are a number of methods for determining the minimum ecological flow, and this needs to be agreed with the MEFWA together with the EPA and the River Basin Councils. RBMPs are being prepared for Seman and Drin basins and will need to contain details of the minimum environmental flow in line with the EU water framework directive (EU WFD refers to minimum environmental flows). Flushing the sediment and maintaining a functional minimum flow will in combination mitigate the ad-

verse impacts to the sediment transport, hydrologic and hydraulic regimes of the affected river or stream. The RBMP will also provide the framework for addressing issues on hydropower and irrigation and design allocation.

(c) Channel structures
The susceptibility of channel structures to damage is strongly related to changes in channel morphology and changes in sediment regime. Increased suspended sediment will cause problems at intake structures in the form of siltation as well as pump and filtration operation. Abstraction structures may become clogged with sediment or left some distance from the water. Degradation of the river bed is likely to threaten the structural integrity of hydraulic structures (intakes, headworks, flood protection etc.) and bridges.

Mitigation measures
The best mitigation measure is to maintain the river's pre-existing hydrologic, hydraulic and sediment transport regimes as described above.

(d) Sedimentation
Irrigation schemes can fail if the sediment load of the water supply is higher than the capacity of the irrigation canals to transport sediment. Sediment excluders/extractors at the headworks can mitigate this effect to some extent. Sedimentation is a disturbing problem for all the reservoirs that are being considered under the first year of WRIP.

Sedimentation from within the I&D scheme itself can also be a problem, for example, wind-blown soil filling canals. Canal de-silting is an extremely costly element of irrigation maintenance and design measures should minimize sediment entry. Reservoir siltation shortens the active life of the reservoir and must be given careful consideration at the design stage. The increases in erosion due to the economic activity prompted by the reservoir and its access roads needs to be taken into account. Upstream erosion prevention, particularly within the reservoir catchment is an important consideration.. However, this may not be sufficient to significantly reduce reservoir sedimentation, especially in view of the time delay between soil conservation activities and a reduction in river sediment loads

Mitigation
Soil erosion measures on a watershed wide basis are the recommended best management practice. This should include basic agricultural techniques including contour farming, and planting of winter crops. Additional methods include maintaining grassed swales in areas where runoff concentrates, maintaining brush or forest buffers along all stream courses of all types (e.g., channels or swales with ephemeral, intermittent or perennial flow).

Special attention should be given to preventing rill/gully formation as this is a major slope process that produces significant sediment. If rills of gullies are present, then measures to combat or eradicate them should be implemented.

7.3.7 Biological and ecological impacts

The main impacts associated with I&D projects are a consequence of the change of land use and water use in the project area but effects on the land around the project and on aquatic ecosystems that share the catchment are also likely. The overall habitat as well as individual groups (mammals, birds, fish, reptiles, insects etc.) and species need to be considered. Rare and endangered species are often highly adapted to habitats with very narrow ranges of environmental gradients. Such habitats may not be of obvious economic value to man, e.g. arid areas, and therefore current knowledge of the biota may be poor and a special study may be required.

The consumption of water for irrigated agriculture and the reduced quality of return flows is likely to adversely impact on downstream ecosystems. Reduced flows, increased salt concentrations, lower oxygen levels, higher water temperatures and increased pollution and silt loads all tend to favour vigorous, toler-

ant species (aquatic weeds). The demands of different ecotypes will change through the year both in quantity and quality.

Mitigation measures

The nature of irrigation, i.e. providing water to water-short land, will radically change both the agricultural and natural ecology in the project area. The creation of compensation areas or habitat enhancement within and/or outside the irrigation command area may be useful mitigation measures where the natural habitat change is assessed as detrimental. The creation of reservoirs and channels provides the possibility of enhanced aquatic habitats. In particular, reservoirs and channels offer the opportunity of fish farming with native species and other forms of aquaculture and favourable habitats for water fowl, both permanent and migrating, but may also offer favourable habitats for disease transmitting insects and snails. Bird sanctuaries and wildlife parks can also be created around reservoirs.

8 SOCIO-ECONOMIC IMPACTS

Socio-economic impacts for the appropriate implementation of the project have been considered and these are very important, considering that they can cause the failure or jeopardise the project, and create financial risks for the community or the investment authority. In the ranking procedure for socio-economic impacts, similar tables to those used for environmental impacts have been used.

8.1 Positive Socio-Economic Impacts

The positive socio-economic impacts, are focused at three levels, national, regional and local, with the latter being the most important. In the following Table 8-1 expected positive socio-economic impacts are screened for the project development during the construction and operation phases.

Table 8-1: Screening of Positive Socio-Economic Impacts

Types of Positive impacts	Construction phase	Operation phase	Spatial efficiency	Impact duration
Impacts to human incomes	Considerable – Temporary Employments	High, Long term employment and increasing of incomes by improving crop and plant production, indirect ensuring better services and food for livestock etc.	Reduction of Migration of local community	1.Operation – Long Term 2-Construction-Short/Medium Term
Impacts to local and national economy	Human and assets risk control	1. Financial guarantees 2. Reducing expenditures for emergency measures like relocations, furniture with foods and other goods, cleaning actions etc in different sites flooded before Saving of farms, products, houses etc.	Positive effects to a good part of lowland irrigated by reservoirs	1.Long term in operation phase 2.Short term in construction phase
Financial/ Educational impact	Small	Increase the agriculture land value of site under irrigation	Giving positive example in the country and regional level as successful action	Long term in operation phase
Social/cultural impacts	Temporary improvement of standard life level	Increasing the opportunity for studying, education and recreation by increasing of incomes Improving the quality of life of women in the command area due to multiple community development initiatives such as increased incomes, adult literacy, improved health, better access, and inclusion in community decision making	Reduce migration pressure in the closed inhabited sites or cities.	1.Long term in operation phase 2.Short term in construction phase
Demographic impact and social development	Not considerable	Maintain the right ratio of local population structure and of gender split	Ensure the appropriate development of population and facilitate labour and financial planning Establish operation of democratic, gender sensitive and transparent water management organisation at different levels	Long term in operation phase
Small scale hydropower potential	Not active	Important for some sites where enough water reserves	Providing an alternative income source for the surrounding area	Long term
Increased cropping intensity	Not active	Important for all I&D sites being rehabilitated	Improved irrigation water supply will provide better crop growth	Long term

Types of Positive impacts	Construction phase	Operation phase	Spatial efficiency	Impact duration
Improved crop yields	Not active	Important for all I&D sites being rehabilitated	Yield will improve with improved drainage, inputs and crop husbandry	Long term
Improved crop diversification	Not active	Important for all I&D sites being rehabilitated	Improvement of land capability by irrigation and drainage and improved access to seeds and markets	Long term
Better Road access	Small	Important as long and maintenance is continued	Will allow faster access to markets and enable increased secondary economic activities providing more employment opportunities	Long term

From Table 8-1 it can be clearly seen that the overall positive impacts are quite significant and long term during the operation phase and justify project development. Still, to ensure an appropriate evaluation of ratio between positive imputes and negative effects, identification of the negative social impacts remains an obligatory step.

8.2 Negative Socio-Economic Impacts

Negative socio-economic impacts are primarily focused on social, economic and cultural impacts. The following screening Table 8-2, considers the impact sources, impact type and weight, effects on the social-economy and duration.

Table 8-2: Screening of Negative Socio-Economic Impacts

Type of possible impact	Project phase	Impact weight	Negative impact effects on the Socio-Economy	Impact Duration
Accidents and health impacts	Construction	Moderate to High	• Loss of productivity • Cost to health services • Worry and stress	Short term
Reducing of reservoir capacity and I&D scheme during reconstruction works	Construction	High/ Moderate	• Reduction in crop, vegetable and fruit production. • Decreasing of services for livestock • Unemployment • Financial stress	Relatively short
Conflicts between reservoir management authorities and fish firms, hydropower administrators etc.	Temporary at construction Permanent at Operation	High	• Complaints between interested parties on reservoir use. • Delay to reservoir management can jeopardise potential • Risk on financial crises of parts in conflict. • Social issues at local and higher levels	Long Term
Use the land for disposal of construction material and for movement of motor vehicles	Construction phase	High	• Conflicts between the land administrator/user or owner and project implementer	Moderate Term
Enlargement of existing roads or opening of new roads, spillways etc	Construction phase	High	• Conflicts between the land administrator/user or owner and project implementer	Moderate to long term
Damage of infrastructure (Damaging roads, electricity net etc)	Construction phase	High	• Conflicts between community and project implementer	Moderate term
Dredging of rivers or quarrying mountain slopes to obtain construction material	Construction phase	High	• Inciting erosion (cumulative impact) and loss of agricultural or forest/pasture lands. Economic stress	Long term
Create differences/ jealousy between owners of the land under irrigation and others	Operation phase	Low	• Creation of economical differences between land users/owners in the region	Long Term
Poor quality of irrigation waters	Operation phase	Very high	• Destruction or reduction of crop, vegetable and fruit production	Long Term

Type of possible impact	Project phase	Impact weight	Negative impact effects on the Socio-Economy	Impact Duration
Exposure of farmers and labourers to pesticides and other hazardous products	Operation phase	High	• Loss of productivity • Cost to health services • Worry and stress	Long term

As can be seen in the table above, the main negative impacts tend to occur during the construction phase. Still it is important, to be underlined that some of the negative impacts during the operation phase are quite significant and cumulative. The importance of water quality, coordination and compliance of reservoir use and downstream use, accompanied with some amelioration of institutional framework can ensure a good and beneficial project implementation.

It is also important to make farmers/WUOs, DIDs etc. aware of he risks and hazards and safe practices for handling, storing, using and disposal of pesticides and also in sustainable pest management based on an IPM approach. Training in this regard will be provided through the MARD. The provisions for this training need to be described in the Site Specific ESMP for I&D schemes.

8.3 Main socio economic issues affecting irrigation

The major purpose of irrigated agriculture is to increase agricultural production and consequently improve the economic and social well-being of the area being developed. Although irrigation schemes usually achieve this objective, changing land-use patterns are a common cause of problems.

In Albania the change to a market economy and unclear land ownership laws has caused social, environmental, and economic problems. The failure to recognise people as partners in the planning and implementation processes can seriously undermine irrigation and drainage development projects.

(a) Conflict and Jealousy
Modern water/irrigation rehabilitation schemes can become arenas of multiple conflicts and jealousy where the following are worth noting:

- there is conflict among water users over water allocation, land rights, or maintenance issues;
- conflict may arise between users and the authority responsible for the project over inappropriate design of infrastructure, water charges, or management issues;
- conflict between project beneficiaries and non-beneficiaries is often inevitable. The latter often question the justice of being excluded from the benefits of irrigation water projects. Indeed, project beneficiaries are frequently considered enjoying special privileges that are denied other households without any justification; and
- there is conflict between donor agencies and the recipient country over design, management, environmental impact, and financial issues.

Small plots, communal land-use rights, and conflicting traditional and legal land rights all create difficulties when land is converted or rehabilitated to irrigated agriculture. Land tenure/ownership patterns are almost certain to be disrupted by major rehabilitation work. Access improvements and changes to the infrastructure are likely to require some field layout changes and a loss of some cultivated land etc.

Mitigation measure
User participation at the planning and design stages of the rehabilitation of existing schemes can minimize negative impacts and maximize positive ones. Consultations with and using the assistance of NGOs can also greatly minimize adverse socio-economic impacts. The role of the RBC and the MARD will also be important for managing water resources in an equitable way.

(b) Income generation:
The most common socio-economic problems reducing the income generating capacity of irrigation schemes are:

- the social organization of irrigation operation and maintenance (O&M):
    - who will carry out the work (both operation and maintenance)?
    - when will irrigation take place (rotation schedules)?
    - how will fair delivery be determined (communication and measurement)?
- Poor O&M contributes significantly to long-term salinity and water-logging problems and needs to be adequately planned at the design stage.
- reduced farming flexibility - Irrigation may only be viable with high-value crops thus reducing activities such as grazing animals, operating woodlots;
- insufficient external supports such as markets, agro-chemical inputs, extension and credit facilities;
- increased inequity in opportunity, often as a result of changing land-use or water use patterns. For example, owners benefit in a greater proportion than tenants or those with communal rights to land.

Mitigation measure
Improved planning, with user involvement, has the potential to reduce if not remove the above problems for irrigation rehabilitation projects. Extension services, with training and education, also offer much scope to improve the income and amenity of irrigation schemes.

(c) Human health:
Dams and irrigation canals can create a variety of health risks, in part because of ecological change (standing water breeds insects such as mosquito and snail propagation etc). Irrigation canals can also contain water with excessive pesticide residue, hence it is important to prevent people (especially children) playing or swimming in them.

Mitigation measure
Improved signage at danger spots and public awareness campaigns within villages and within schools can mitigate against this occurrence.

(d) Minority Groups and Women
Minority groups and women can benefit from the increased economic development of a rehabilitated irrigation area. However, they are often disadvantaged by irrigation development if they are excluded from the scheme because of their gender etc.

Mitigation measure
Minority groups and women in particular must have representation within the WUOs. Their participation in the decision making process is critical in ensuring that their needs are met and that they are not disadvantaged by the opportunities provided under the Project

(e) Compensation and resettlement
The ESIA work carried out to date indicates that the existing dams and reservoirs and the I&D schemes predominantly lie within the footprint of the existing development and where they do encroach (for example with the raising of TWL at four reservoirs) the land is state owned. Notwithstanding, it is important that full details on any project affected persons (PAPs) are recognized and they are included in necessary inventories and censuses for the RAPs to be completed. At this stage, without the final design for I&D schemes rehabilitation, it is not possible to provide exact details.

Mitigation measures
The Resettlement Policy Framework (RPF) outlines the mechanism and tools for addressing the potential scope of resettlement, land acquisition and compensation issues outlined above. The RPF is provided as a separate deliverable under WRIP.

9 ANALYSIS OF ALTERNATIVES

It is normal practise when assessing development projects that a number of alternatives should be considered to ensure that the project that has been selected (in this case rehabilitation of dams for improved safety and rehabilitation of I&D schemes for improved water management and crop production) is the most optimal solution. Project alternatives therefore need to be clearly presented (including the 'zero option' alternative) and this section provides these details including the delayed project option, the alternative site relocation option and others such as considering alternative sources of water and demand reduction through conservation and re-use and water management and monitoring.

9.1 The Zero Option

The zero option would imply that the current state of the 13 reservoirs will continue to be in such a dilapidated and deplorable condition that it would become unsafe for the general public, particularly those people living immediately downstream.

It will also result in poor agricultural development within the regions that the irrigation reservoirs serve. The general public will also be denied easy access to agricultural goods and services.

Therefore the do nothing alterative will exacerbate the present situation and further degenerate poverty that exists around the settlements located close to the reservoir locations.

The Zero Option is not acceptable on environmental and social grounds.

9.2 The Delayed Project Option

This option implies postponing the proposed irrigation dam rehabilitation activities. This is not advisable considering the criticalness of the persistent condition of the dams and since the prevailing economics and the political environment is favourably disposed towards the project.

The implication, therefore of delaying the project will mean that all processes that have been put in place for the project implementation will have to be demobilised. Furthermore, because of the inflationary trends in economy[18], such a delay may result in unanticipated increases in project costs. These, and other related problems make it unattractive to adopt the delayed project option.

The Delayed Project Option is not acceptable on social and economic grounds.

9.3 Alternative Site-Relocation Option

The WRIP involves rehabilitation of existing dams, reservoirs and I&D schemes, consequently there are no alternative sites been proposed for the reservoirs. This has been confirmed by the Consultant working on the Feasibility Studies for the 14 dams[19] In terms of the alternatives for the irrigation schemes, there are no new irrigation areas planned. The existing options all utilise existing irrigated areas. The selected irrigation options (usually between 2-3 options for each I&D scheme) has generally selected the lowest cost option involving gravity irrigation techniques to reduce on pumping costs which are prohibitive in Albania.

The Alternative Site Relocation Option is not relevant in this case for dam rehabilitation and for I&D schemes is not acceptable on environmental and economic grounds.

[18] Annual inflation in Albania is running at around 4% (source CIA World Fact book)
[19] Meeting between COWI and Mott MacDonald 27th April 2012

9.4 Other Alternatives

Besides the alternatives referred to above irrigation projects need to consider alternative sources of water and demand reduction through conservation and re-use and water management and monitoring should be considered.

In terms of the suggesting alternative sources of water, this is not really feasible, as the reason the dams and reservoirs were built in the first place was to provide the water for irrigation, as there were water shortages from existing sources.

Irrigation using pumped water from groundwater supplies is more expensive and would require a considerable amount of investment to provide the boreholes to be drilled throughout the irrigated area to meet the demand. Furthermore, the return irrigation water may deteriorate the quality of the groundwater to make it unsuitable for irrigation and crops. In addition this may lead to groundwater rise and secondary salinization.

Pressurised irrigation (using pumps) is an excellent technique for managing water effectively and efficiently but would require higher levels of investment and maintenance, have higher running costs (more complex technology) and higher skills requirements for operation and water scheduling.

Water conservation within irrigation is an important issue and there are some radical measures that could be used (drip irrigation), but these techniques are expensive and require a lot of care in setting up. The technique is not well known in Albania and would require a completely new service industry to support it. Reuse of irrigation water is also not advisable for the reasons mentioned above and this may also not suit the crops that are grown.

Improved water management techniques and improved operation and maintenance of irrigation schemes, together with improved training and capacity building at WUA level are water conservation and water management issues that are factored into the existing project.

10 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

This section provides generic guidance for the preparation of site specific ESMPs. These ESMPs for sub-projects will include:

i. Assessment of the environmental impacts predicted at the various stages on the dam safety and the I&D schemes rehabilitation, notably pre-construction (or design), construction, operation (including maintenance of sites) and decommissioning (if relevant), the time they are likely to occur, and their scale, scope and effect(s) on environmental media and humans.
ii. Determination of acceptable level of each impact, especially with respect to its occurrence, likely duration, scale, effect(s), cost(s) (see also (iv) below), and the permitted legal levels established by the respective national or international standards.
iii. Description of conditions and measures to be taken to mitigate those impacts that are likely to arise at each stage, responsibility assigned for implementation, whether though improved design, special protection measures during construction, or some other method, their likely costs, implications for project completion, etc.
iv. The resources and methods required for monitoring during project implementation, indicators for measuring and ensuring quality of ESMP actions (what is to be measured, when and where, by whom and why); institutional responsibilities for each action required; and capacity building requirements required, and the respective costs of each element.

The ESMP will comprise two separate documents:

- Mitigation Plan, dealing with aspects described in (iii) above, and
- Monitoring Plan dealing with aspects described in (iv) above.

In addition the work on the dams safety rehabilitation is anticipated to commence in the first year of the project, whereas the rehabilitation work on the I&D schemes will probably take place later in the first year and into the second year. Taking note of this, the ESIA Consultant has prepared two ESMPs; the first for the dam safety rehabilitation and surrounding ancillary work requirements and the second for the I&D schemes rehabilitation.

The ESMP for both parts of the rehabilitation (Dam safety and I&D schemes) is expected to finalised at detailed design completion and should incorporate any requirements specified in the environmental approval granted by the Regional Environmental Agency (REA). The requirement for approval by the REA or any other respective authority should also be noted. This is anticipated to include the tender documents when such ESMP measures are to be undertaken by the Contractor during the construction phase or by the Contractor/Operator during the operation phase of the project which would also include the defects liability period.

The ESFD has taken into consideration all types of situations that may apply to dam and I&D rehabilitation works, but the impacts and mitigation measures outlined may not necessarily be relevant for a site specific ESMP. The Site Specific ESMPs prepared will therefore be more tailored to reflect the actual situation and appropriate mitigation measures included as necessary.

10.1 Environmental Mitigation Plan

The mitigation measures are related to the expected impacts defined above. The mitigation measures are focused on both environmental and social impacts, focusing on the framework and considering overall impacts. A preliminary mitigation plan for the pre-construction, construction and operation phases for dam safety rehabilitation is shown in Table 10-1 below. The ESMP for I&D schemes rehabilitation is shown in Table 10-2 below.

At the next project stage (site specific ESMP) the likely impacts will be defined in detail for each reservoir or per groups of reservoirs with similar environmental and social characteristics and for I&D schemes (to be rehabilitated in the second year). The costs of mitigation measures are included only in case of overall costs like known facilities or operations etc. Much of the cost of undertaking mitigation measures during the construction stage needs to be assigned to the Contractor and it is important that the mitigation measures mentioned in the ESMiP for both dam safety and I&D schemes rehabilitation are included in the detailed design and in the tender documents to ensure that they are covered.

10.2 Measures to Improve ESMP

Strengthening of the institutional framework can help for facilitation of the implementation of the ESMP in the framework of revitalization of the irrigation system.

10.2.1 Decentralisation of responsibility

This section provides suggestions for improvement of institutional efficiency relating to irrigation and drainage as well as to reducing their negative environmental effects. When considering the existing status of water management in Albania, and its enforcement by institutions, decentralization is a way by which responsibilities and rights for water use and management can be shared

As mentioned previously, Law no. 8518, dated 30.7.1999 "On Irrigation and Drainage" is intended to:

- define the legal framework for establishment and operation of water user Organizations, federations of water user organizations and drainage boards;
- establish an institutional framework to serve a national policy for irrigation, drainage, flood protection and erosion;
- determine the rights and duties of individuals and entities that deal with irrigation, drainage and flood protection and erosion; and
- to regulate the transfer of irrigation systems to water user organizations and federations of water user organizations.

The I&D law was adopted in 1999 and was amended in 2008. During this period rapid changes have occurred towards decentralization of competencies of the Central Government and the reorganization of public ownership and state properties (decentralization of ownership). From this point of view, the current law does not reflect these changes, which could be reflected in a new law "On Irrigation and Drainage" or by amending the existing law

The new Law “On Administration of Irrigation and Drainage”, the key institutions for water management in I&D systems sets Regional Directorate of irrigation and Drainage, (under MARD) and municipalities as responsible for water use. During this current period, the law on "Transfer of Public Property" has been enacted and transferred to local government together with a major part of the I&D systems.

Table 10-1: Environmental and Social Mitigation Plan for Dam Safety Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
Pre-Construction Phase					
TENDER AND DESIGN MEASURES					
Contractor's Camps	• Temporary loss of land and impacts of inadequate physical and social management of camps and workforce	• Use land of lowest value: identify sites and prepare to apply RPF and RAP procedures; • Include land users in RAP compensation packages, and/or establish mandatory process for user identification and compensation; • Require construction contractor to appoint part-time Community Relations Officer & establish a formal Social Responsibility system (tender documents); • Require full site restoration on completion of construction (tender documents); • Consider future permanent use of contractor's facilities.	• MARD •	• During tender process	• Include in tender for contractor
Construction access and traffic	• Unsafe access routes and construction traffic hazards	• Develop mandatory procedures for negotiating rights of way for temporary access as part of RAP; • Require implementation of a comprehensive Traffic Management Plan during construction (tender documents).	MARD	• During tender process	• Include in tender for contractor
Construction Materials	• Impact of pits and quarries: land, health, Safety • Hazards from use of Asbestos • Procurement from environmentally & socially responsible suppliers	• Require Method Statements for pits and quarries, with details of location, working, closure etc. (tender documents). • Ban Use of Asbestos	MARD	• During tender process	• Include in tender for contractor
Spoil Disposal	• Improper disposal and treatment of spoil dumps	• Require Method Statements for spoil disposal with details of authorisation, location, placement, closure etc (tender documents)	MARD	• During tender process	• Include in tender for contractor
Waste Management and Pollution	• Improper disposal of solid and liquid wastes; spills & inadequate clean-up	• Require Waste Management Plan, SOPs for vehicle washing, refuelling, working in water, and Emergency Response Plan etc. (tender documents).	MARD	• During tender process	• Include in tender for contractor
Human Health and Safety	• Potential Health and Safety hazards:	• Incorporate safety and environmental requirements in contract documents. • Provide information on mitigating safety and warning measures; • Capacity building to emphasis need for safe working environment, good supervision, etc • Careful planning and scheduling of work activities, • Include provision for driving code of conduct in tender documents	MARD	• During tender process	• Include in tender for contractor
Cultural Heritage	• Loss of archaeological heritage	• Include chance find procedure in tender document	MARD	• During tender process	• Include in tender for contractor
SOCIAL – ECONOMIC FACTORS					

Table 10-1: Environmental and Social Mitigation Plan for Dam Safety Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
Human Health	• Potential Health and Safety hazards:	• Involve communities, • Public awareness campaign, • Fence hazardous areas. • Correct design and safety procedures, • Correct disposal of waste,	MARD	• Prior to construction	• Include in tender for contractor
Health – (Noise)	• Potential noise disturbance from Construction works	• Pre-Preparation of noise barriers (earthen banks and trees) to absorb noise	MARD	• After tender but prior to commencement of dam rehabilitation works	• Include in tender for contractor
Health – (Lighting)	• Potential light disturbance in specific areas of settlement	• Pre-preparation of specific screened areas by installing light barriers around construction sites, worker camps, workshops etc	MARD	• Prior to commencement of dam rehabilitation construction.	• Include in tender for contractor
Land Use	• Disturbance of land use and economic activities. • Loss of land. • Loss of traditional irrigated supplies.	• Strict adherence to RPF and RAP prescribed activities and measures; • Use of public land areas as much as possible; • Provision for proper compensation in accordance with Albanian Law. • Provision of new land (if necessary) in accordance with Albanian law • Appropriate care and consideration provided to affected people. • Provide for alternative or regulated irrigated supply (if necessary)	MARD	• Solve as soon as possible after public consultations and granting of permission, especially before construction.	• Not able to ascertain yet
ENVIRONMENTAL FACTORS				MARD	
Biodiversity	• Potential loss of species that may be important through lack of baseline data.	• Ascertain if baseline biodiversity survey within the affected area is necessary and search for data, (Note: Rehabilitation works primarily within the footprint of the existing area of the reservoir, so unlikely to be required). • Prepare conservation plan for protected species that may be endangered, exterminated or permanently destroyed	MARD	• Prior to commencement of dam rehabilitation construction.	• Covered under tender for contractor (if found to be necessary)
Climate Change	• Climate extremes affect project area	• Apply measures contained in the 2nd National Communication on Climate Change (NCC) (found in Tables 4.7 and 4.8 of the 2nd NCC including improved monitoring, plan for tree planting wherever possible, plan for low powered on site lighting using renewable sources, promote stakeholder awareness. • Determine EIA guidelines for evaluation.	• MARD • MTE	• Prior to commencement of rehabilitation construction.	• Any measures needed to be included in tender document.
Cultural Heritage	• Potential loss of pre-historic/archaeological sites that may be important due to lack of baseline knowledge.	• Undertaken appropriate archaeological survey within the affected area to determine the initial state, however the works are primarily within the footprint of the existing dam and reservoir, so it is unlikely that there will be major finds.	• MARD • CEIA undertaking Baseline survey	• Prior to commencement of rehabilitation construction.	• Covered under WRIP

Table 10-1: Environmental and Social Mitigation Plan for Dam Safety Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
Construction					
SOCIAL – ECONOMIC FACTORS					
Contractor's Camps	• Temporary loss of land and impacts of inadequate physical and social management of camps and workforce	• Apply best practice for site management including social aspects • Remove all temporary facilities and restore land to original condition or better • Hand over any contractor's facilities in good condition	• Contractor	• Throughout the dam rehabilitation construction. • At end of contract	• Include under works contract
Human Health	• Work related accidents during construction.	• Maintain strict health and safety regulations in compliance with Albanian law and WB Health and Safety Guidelines. • Provide regular information/signage on site regarding mitigating safety and warning measures; • Continued capacity building to emphasis need for safe working environment, good supervision, • Careful planning and scheduling of work activities during construction phase. • Maintain regular contact with communities, • Introduce strict policy for all workers to wear safety equipment, hart hats etc • Fence all working areas. • Prevent children swimming in reservoir • Keep emergency first aid kit easily accessible at all times • Undertake correct disposal of waste water and solid waste,	• Contractor	• Throughout the dam rehabilitation construction.	• Include under works contract
Health – Road Safety	• Road accidents exacerbated by construction traffic	• Implement and maintain effective speed control measures.	• Contractor	• Throughout the dam rehabilitation construction.	• Include under works contract
Health – (Noise/ Vibration)	• Noise and vibration disturbance from Construction works.	• Limit construction times to daylight hours. • Fit covers to all powered mechanical equipment, generators, compressors etc. • Keep public informed for on-site activities likely to cause disturbance (using local media)	• Contractor	• Throughout the dam rehabilitation construction.	• Include under works contract, • Cover for generators ~Euro200/ unit
Health – (Dust)	• Dust in the atmosphere caused by blasting, quarrying and construction traffic.	• Use dust suppression techniques (access road watering) throughout hours of construction • Prohibit burning of construction/waste materials on site	• Contractor	• Throughout the dam rehabilitation construction.	• Include under works contract
Health – (Lighting)	• Potential light disturbance in specific areas of settlement	• Use non intrusive lighting in operational areas as much as possible.	• Contractor	• Throughout the dam rehabilitation construction.	• Include under works contract

Table 10-1: Environmental and Social Mitigation Plan for Dam Safety Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
Infrastructure	• Poor planning of resettlement infrastructure (if necessary)	• Strict adherence to RAP prescribed activities and measures. • New settlements located near to existing ones (if found necessary) • Good planning of social infrastructure (roads, footpaths, foot bridges across reservoirs (if necessary), consideration given to cycling routes, water services, school, healthcare, public administration offices, public spaces and etc.)- It is unlikely that any infrastructure will be affected.	• Contractor	• Prior to construction	• Include under works contract
Infrastructure	• Unsightly and vacated buildings in inundated zone which can cause danger to recreational use as a reservoir (If relevant)	• Strict adherence to RAP prescribed activities and measures. • Demolish and clear all buildings designated to be in zone of inundation in accordance with the appropriate law (probably unlikely) • Make appropriate use of recycling materials wherever possible (i.e. cables, pipe work etc).	• Contractor	• During construction	• Include under works contract
Use of Raw Materials	• Uncontrolled exploitation of natural resources	• Use raw materials from approved suppliers with valid licences issued by REA	• Contractor • MTE/REA	• During construction	• Include under works contract
Public Relations	• Breakdown of trust between stakeholders and the public.	• Strict adherence to RAP prescribed activities and measures. • Full transparency between stakeholders and the public on all activities. • Appropriate training of part time Public Relation Officers	• MARD • Contractor	• Throughout the dam rehabilitation construction.	• Include under works contract
Resettlement (if relevant)	• Poor communication on the resettlement process • Trauma and stress of local population in the resettlement process • Limited institutional capacity of responsible authorities	• Strict adherence to RPF /RAP prescribed activities and measures. • Provision of sufficient information to communities and ensuring the proactive participation of the affected population in the resettlement process (if necessary). • Appropriate care and respect to the resettlement of affected people (many who may be infirmed or elderly) to reduce the traumatic experience of moving (if necessary). • Ensure the necessary institutional capacity of responsible authorities/stakeholders involved in the expropriation/compensation and resettlement affairs.	• MARD •	• Prior to construction	• Training course for GoA officers ~USD5,000
Employment	• Large amount of existing unemployment	• Maximise/ prioritise employment opportunities for local people in the areas of dam rehabilitation	• MAFCP with cooperation of the Contractor	• Throughout the dam rehabilitation construction.	• Include appropriate clause under works contract
ENVIRONMENTAL FACTORS					

Table 10-1: Environmental and Social Mitigation Plan for Dam Safety Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
Flora and Fauna	• Disturbance to natural habitats especially during un-seasonal working, changes in environmental regimes etc.	• Careful placement, alignment, design of dam site ancillary works, pipelines and structures and or timing of work (seasonal working) especially for any rare /sensitive species • Protect sensitive locations of terrestrial and aquatic biota near construction sites. • Ensure ecological flow of river is maintained for biota downstream (if perennial river included). • Select appropriate construction methods that are less harmful/ noisy. • Reduction in artificial lighting within limits of safety.	• Contractor	• Throughout the dam rehabilitation construction.	• Include under works contract
Flora	• Existing trees and shrubs in area of inundation pose a danger to recreational use of reservoir. (if relevant)	• Appropriate clearance of all shrubs and trees within the zone of inundation, making full use of timber produced wherever possible.	• Contractor	• Throughout the dam rehabilitation construction.	• Include under works contract
Flora	• Loss of indigenous vegetation due to rehabilitation construction works.	• Develop nursery for indigenous plants so that there is a wider variety (in terms of maturity) of planting available for affected areas and areas designated for landscaping.	• Contractor	• Throughout the dam rehabilitation construction.	• Include under works contract
Geology/ Seismic	• Potential danger of dam failure from earthquake or earthquake induced landslide.	• Develop an Emergency Response Plan in case of earthquakes, including most importantly an Emergency Evacuation Plan for population prone areas downstream in case of dam wall failure. • Develop infrastructure for Emergency Response Plan implementation (warning signals, evacuation routes etc). • Installation of sophisticated seismic monitoring network.	• MARD • Specialist Contractor	• At specific time in the dam rehabilitation construction	• To be determined • Monitoring network ~USD 15,000 per site
Soils	• Damage to soil structure due to material storage, construction traffic, etc • Loss of topsoil during excavation works. • Erosion due to uncontrolled surface run off and wastewater discharge:	• Protect non-construction areas, avoid work in sensitive areas during highly adverse conditions, restore damaged areas • Strip topsoil as necessary and store, replace/reuse post construction • Design drainage +disposal facilities to ensure soil stability.	• Contractor	• Throughout the dam rehabilitation construction.	• Include under works contract
Land	• Damage to land during construction, landslides on embankments, hillsides etc. • Impacts from excavation for disposal of soil and other materials.	• Protect non-construction areas. • Design works to minimise land affected. • Design slopes to and retaining structures to minimise risks, provide appropriate drainage, soil stabilisation/vegetation cover.	• Contractor	• Throughout the dam rehabilitation construction.	• Include under works contract

Table 10-1: Environmental and Social Mitigation Plan for Dam Safety Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
Water Resources	• Interruption of surface drainage patterns during construction, creation of unsightly areas of standing water • Contamination/pollution by construction, human and animal waste, including fuel and oil spills, hazardous waste, wastewater etc	• Undertake careful design, maintain natural drainage where possible, and provide suitable wastewater drainage, • Safe and sanitary disposal of any hazardous wastes. • Wash construction vehicles and machinery only in designated areas where runoff will not create pollution • Adequate protection from / control of livestock, agriculture, casual human contact, hazardous materials – fuel oil etc (including suitable storage) • All oily waste to be collected separately	• Contractor	• Throughout the dam rehabilitation construction.	• Include under works contract
Air Quality	• Dust and fumes during construction/ rehabilitation activities	• Control dust with water spraying, control construction methods and plant, • Fit covers/tarpaulins to lorries • Schedule work during more socially amenable times. • Ensure all septic tanks/ latrines are hermetically sealed • Control vehicle speeds in surrounding/ residential areas. • Prohibit burning of construction/waste materials on site • Ensure local community is kept fully informed about the rehabilitation construction activities and blasting routines (if found necessary)	• Contractor	• Throughout the dam rehabilitation construction.	• Include under works contract
Acoustic Environment	• Noise disturbance from construction works and traffic (if near houses) • Also disturbance to animal	• Time work to minimise disturbance. • Appropriate construction methods + equipment with covers to generators • Restrict through traffic in residential areas. • Careful siting and/or design of long term construction plant,	• Contractor	• Throughout the dam rehabilitation construction.	• Include under works contract • Generator cover around Euro 200/ unit
Historical / Cultural Sites	• Disturbance or degradation to known cultural sites (considered unlikely)	• Careful siting alignment of construction/ rehabilitation works. • Special measures to protect known cultural resources	• Contractor	• Throughout the dam rehabilitation construction.	• Include under works contract
Cultural Heritage / Chance Finds	• Irretrievable loss of heavy damage to important artefacts and historical knowledge of the surrounding area	• Early screening by Directorate of Cultural Heritage and IoA • Record including photos and filming the details of the chance find • Make modification to proposed works if the finds are not moveable	• MTCYS • IoA - Academy of Sciences • Contractor	• Throughout the dam rehabilitation construction.	• To be determined can delay the works
Cultural Heritage - Graves	• Inundation or disturbance of burial places within settlements affected. (unlikely)	• Appropriate consideration to graveyard (involving re-interment) that may be affected by the inundation. This is considered very unlikely as the reservoir sites are existing facilities. • To be undertaken in a considerate manner with full discretion and respect to the affected families and relatives.	• To be determined	• Prior to construction	• To be determined

Table 10-1: Environmental and Social Mitigation Plan for Dam Safety Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
Solid Waste	• Minimize disturbance from Solid Waste disposal • Prevent pollution to groundwater and animal health risk	• Mitigate and prevent against solid waste pollution during construction phase • Construction workers to be properly briefed regarding garbage disposal and protection of the environment. • Organise appropriate refuse collection and disposal regime	• Contractor	• Throughout the dam rehabilitation construction.	• Include under works contract • Waste management fee about Euro 70/yr • Bins for solid waste about Euro 140 each x 14 • Septic tank about Euro 1500 each
Completion /Operation Phase					
SOCIAL – ECONOMIC FACTORS					
Economy	• Maximize economic benefits due to dam function	• Increase potential for irrigation, flood control, water supply, potential eco-tourism, water recreational activity (fishing, boating, hiking), and corresponding communities enjoying an improved standard of living. • Also important to assess the potential for improved groundwater, surface water management (especially downstream) due to the altered flow regimes (if relevant)	• MARD	• At the start of operation	• To be determined
Infrastructure	• Degradation of existing infrastructure in the area	• Improvement to ancillary infrastructure associated with irrigation to enable maximum benefit to be obtained from local communities and consequent improvement in the standard of living of the indigenous inhabitants by the constructing new roads, improved tourism, and a road network to camps for improved eco tourism. • upgrading recreation and sanitation facilities such as water supply and sewerage systems, water service networks and landfills etc	• MARD • MTE	• At the start of operation	• To be determined • Upgrading of WSS services to be linked with existing GoA policy
Constraints between users of reservoirs	• Conflicts between users of reservoirs (irrigation board, hydropower administrators, fishery) from the way/time/amount of use or save the waters for different purposes	• Sign an agreement with the range of operations and their rights between main actors, where responsibilities and rights to be clearly defined) • Involve RBC and MEFWA to ensure water resources are managed in an equitable way.	• MARD • DID, RBC	• Before starting the operation	• Not additional direct costs
Social/ Recreational activities along the river	• Sudden inundation downstream due to unforeseen natural flood events	• Introduce flood warning system downstream of reservoirs	• MARD •	• At the start of operation	• To be determined but depends on the extent of habitation downstream.

Table 10-1: Environmental and Social Mitigation Plan for Dam Safety Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
Damage of agricultural products	• Contamination of agricultural soils or soil degradation using un appropriate waters	• Interrupt irrigation in case of contamination • Control pollution sources • Ensure appropriate water quality for irrigation	• MARD •	• At the start of operation and in dry season	• To be determined by technical team
ENVIRONMENTAL FACTORS					
Low flow regimes (on perennial rivers)	• Loss of biodiversity	• Integrate low flow release strategies into irrigation dam operational protocols / management plans and according to requirements of the RBMP.	• DID • Irrigation operator	• To be determined	• To be determined
Biodiversity	• Loss of biodiversity	• Operate dams to suit downstream requirements and encourage wildlife around reservoirs. • Determine minimum ecological flow and ensure this is released from the reservoir at all times to ensure survival of downstream ecosystems (if on a perennial river) in line with RBMP of the river basin.	• DID • Irrigation operator	• To be determined	• To be determined
Biodiversity Flora and Fauna	• Fish migration issues (i.e. prevention of some river fish species reaching spawning grounds), - (if on a perennial river)	• Implement methods for upstream/ downstream fish movement. Also undertake manual transportation of fish stock (if relevant)	• MTE	• At the start of operation	• To be determined
Biodiversity Flora and Fauna	• Loss of some fish spawning grounds	• Control of illegal gravel extraction and limited licensing for gravel extraction on perennial rivers • Control of seasonal flow and Irrigation operator's water release patterns	• DID • Irrigation operator	• At the start of operation	• To be determined
Low Flow Regime	• River flow reduction that will affect aquatic life (if on perennial river)	• Integrate low flow release strategies into irrigation dam operational protocols / management plans	• DID, • Irrigation operator	• At the start of operation	• To be determined
Sedimentation	• Sedimentation of reservoirs.	• Construct flood bypass tunnels/channels near impoundments to take flood waters (high in sediment load) away from the dam walls. • Construction of small-scale weirs/sediment traps in the upper catchments to trap earth and sands caused by heavy rainfall and subsequent removal.	• MARD • Irrigation operators	• At the start of operation	• To be determined
Soils	• Erosion of top soil after construction	• Re-cultivated exposed surfaces (using native vegetation) immediately after completion of rehabilitation work. • Encourage soil deposits from excavation/ extraction works to be re-used in the vicinity of the works either for landscaping works by the Contractor or by local farmers, inhabitants, community etc.	• MARD • Irrigation operators	• At the start of operation	• To be determined

Table 10-1: Environmental and Social Mitigation Plan for Dam Safety Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
Soils	• Beach Erosion due to wave action along shorelines created by reservoirs	• Take measures to avoid beach erosion (due to wave action) around edge of reservoir by keeping reservoir level slightly below maximum or by introducing soil protection structure (e.g. gabions).	• MARD • Irrigation operators	• At the start of operation	• To be determined
Aesthetics and Landscape	• Localized visual impacts of completed works • Some intrusions in general manmade and natural landscape from loss of trees, vegetation etc.	• Careful siting and design of works, screening of intrusive items. • Replace lost trees boundary structures, re-vegetate work areas. • Careful decommissioning of construction areas and disposal of wastes. • Improvements to dam profiles by improving design	• MARD • Irrigation operators	• At the start of operation	• To be determined

Table 10-2: Environmental and Social Mitigation Plan for I&D Scheme Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
Pre-Construction Phase					
TENDER AND DESIGN MEASURES					
Contractor's Camps	• Temporary loss of land and impacts of inadequate physical and social management of camps and workforce	• Use land of lowest value: identify sites and prepare to apply RAP procedures • Include land users in RAP compensation packages, and/or establish mandatory process for user identification and compensation • Require construction contractor to appoint part-time Community Relations Officer & establish a formal Social Responsibility system (tender documents) • Require full site restoration on completion of construction (tender documents) • Consider future permanent use of contractor's facilities	MARD	• During tender process	• Include in tender for contractor
Construction access and traffic	• Unsafe access routes and construction traffic hazards	• Develop mandatory procedures for negotiating rights of way for temporary access as part of RAP • Require implementation of a comprehensive Traffic Management Plan during construction (tender documents).	MARD	• During tender process	• Include in tender for contractor
Construction Materials	• Impact of pits and quarries: land, health, Safety • Hazards from use of Asbestos • Procurement from environmentally & socially responsible suppliers	• Require Method Statements for pits and quarries, with details of location, working, closure etc. (tender documents). • Ban Use of Asbestos	MARD	• During tender process	• Include in tender for contractor
Spoil Disposal	• Improper disposal and treatment of spoil dumps	• Require Method Statements for spoil disposal with details of authorisation, location, placement, closure etc (tender documents)	MARD	• During tender process	• Include in tender for contractor
Waste Management and Pollution	• Improper disposal of solid and liquid wastes; spills & inadequate clean-up	• Require Waste Management Plan, SOPs for vehicle washing, refuelling, working in water, and Emergency Response Plan etc. (tender documents).	MARD	• During tender process	• Include in tender for contractor
Human Health and Safety	• Potential Health and Safety hazards:	• Incorporate safety and environmental requirements in contract documents. • Provide information on mitigating safety and warning measures; • Capacity building to emphasis need for safe working environment, good supervision, etc. • Careful planning and scheduling of work activities, • Include provision for driving code of conduct in tender documents	MARD	• During tender process	• Include in tender for contractor
Cultural Heritage	• Loss of archaeological heritage	• Include chance find procedure in tender document	MARD	• During tender process	• Include in tender for contractor

Table 10-2: Environmental and Social Mitigation Plan for I&D Scheme Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
SOCIAL – ECONOMIC FACTORS					
Human Health	• Potential Health and Safety hazards:	• Involve communities, • Public awareness campaign, • Fence hazardous areas. • Correct design and safety procedures, • Correct disposal of waste,	MARD	• Prior to construction	• Include in tender for contractor
Health – (Noise)	• Potential noise disturbance from Construction works	• Pre-Preparation of noise barriers (earthen banks and trees) to absorb noise	MARD	• After tender but prior to commencement of I&D rehabilitation works	• Include in tender for contractor
Health – (Lighting)	• Potential light disturbance in specific areas of settlement	• Pre-preparation of specific screened areas by installing light barriers around construction sites, worker camps, workshops etc	MARD	• Prior to commencement of dam rehabilitation construction.	• Include in tender for contractor
Land Use	• Disturbance of land use and economic activities. • Loss of housing. • Loss of land. • Loss of traditional irrigated supplies.	• Strict adherence to RPF and RAP prescribed activities and measures • Use of public land areas as much as possible; • Provision for proper compensation in accordance with Albanian Law. • Provision of new land (if necessary) in accordance with Albanian law • Appropriate care and consideration provided to affected people. • Provide for alternative or regulated irrigated supply (if necessary)	MARD	• Try and solve as soon as possible after public consultations and granting of permission, especially before construction.	• Not able to ascertain yet
ENVIRONMENTAL FACTORS					
Biodiversity	• Potential loss of species that may be important through lack of baseline data.	• Undertake appropriate baseline biodiversity survey within the affected area and search for data, however the works are within the footprint of the existing I&D scheme, so it is unlikely that there will be major finds. • Prepare conservation plan for protected species that may be endangered, exterminated or permanently destroyed	• MARD • CEIA undertaking Baseline survey	• Prior to commencement of I&D scheme rehabilitation construction.	• Covered under WRIP
Climate Change	• Climate extremes affect project area	• Apply measures contained in the 2nd National Communication on Climate Change (NCC) (found in Tables 4.7 and 4.8 of the 2nd NCC including improved monitoring, plan for tree planting wherever possible, plan for low powered on site lighting using renewable sources, promote stakeholder awareness. • Determine EIA guidelines for evaluation.	• MARD • MTE	• Prior to commencement of rehabilitation construction.	• Any measures needed to be included in tender document.

Table 10-2: Environmental and Social Mitigation Plan for I&D Scheme Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
Cultural Heritage	• Potential loss of pre-historic/archaeological sites that may be important due to lack of baseline knowledge.	• Undertaken appropriate archaeological survey within the affected area to determine the initial state, however the works are primarily within the footprint of the existing I&D scheme, so it is unlikely that there will be major finds.	• MARD • CEIA undertaking Baseline survey	• Prior to commencement of I&D scheme rehabilitation construction.	• Covered under WRIP
Construction					
SOCIAL – ECONOMIC FACTORS					
Contractor's Camps	• Temporary loss of land and impacts of inadequate physical and social management of camps and workforce	• Apply best practice for site management including social aspects • Remove all temporary facilities and restore land to original condition or better • Hand over any contractor's facilities in good condition	• Contractor	• Throughout I&D scheme rehabilitation construction. • At end of contract	• Include under works contract
Human Health	• Work related accidents during construction.	• Maintain strict health and safety regulations in compliance with Albanian law and WB Health and Safety Guidelines. • Provide regular information/signage on danger spots on site regarding mitigating safety and warning measures; • Continued capacity building to emphasis need for safe working environment, good supervision, • Careful planning and scheduling of work activities during construction phase. • Maintain regular contact with communities, • Introduce strict policy for all workers to wear safety equipment, hart hats etc • Fence all working areas and prevent children playing and swimming in irrigation channels • Keep emergency first aid kit easily accessible at all times • Undertake correct disposal of waste water and solid waste,	• Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract
Health – Road Safety	• Road accidents exacerbated by construction traffic	• Implement and maintain effective speed control measures.	• Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract
Health – (Noise/ Vibration)	• Noise and vibration disturbance from Construction works.	• Limit construction times to daylight hours. • Fit covers to all powered mechanical equipment, generators, compressors etc. • Keep public informed for on-site activities likely to cause disturbance (using local media)	• Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract, • Cover for generators ~Euro200/ unit
Health – (Dust)	• Dust in the atmosphere caused by blasting, quarrying and construction traffic.	• Use dust suppression techniques (access road watering) throughout hours of construction • Prohibit burning of construction/waste materials on site	• Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract

Table 10-2: Environmental and Social Mitigation Plan for I&D Scheme Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
Health – (Lighting)	• Potential light disturbance in specific areas of settlement	• Use non intrusive lighting in operational areas as much as possible.	• Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract
Infrastructure	• Poor planning of resettlement infrastructure (if necessary)	• Strict adherence to RAP prescribed activities and measures. • New settlements located near to existing ones (if found necessary) • Good planning of social infrastructure (roads, footpaths, foot bridges across reservoirs (if necessary), consideration given to cycling routes, water services, school, healthcare, public administration offices, public spaces and etc.)- It is unlikely that any of this infrastructure will be affected.	• Contractor	• Prior to construction	• Include under works contract
Infrastructure	• Unsightly and vacated buildings in construction zone which can cause danger (if relevant)	• Strict adherence to RAP prescribed activities and measures. • Demolish and clear all buildings designated to be in zone of construction in accordance with the appropriate law (probably unlikely) • Make appropriate use of recycling materials wherever possible (i.e. cables, pipe work etc).	• Contractor	• During construction	• Include under works contract
Use of Raw Materials	• Uncontrolled exploitation of natural resources	• Use raw materials from approved suppliers with valid licences issued by REA or ME	• Contractor • MTE/REA	• During construction	• Include under works contract
Public Relations	• Breakdown of trust between stakeholders and the public.	• Strict adherence to RAP prescribed activities and measures. • Full transparency between stakeholders and the public on all activities. • Appropriate training of part time Public Relation Officers	• MARD • Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract
Resettlement (if relevant)	• Poor communication on the resettlement process • Trauma and stress of local population in the resettlement process • Limited institutional capacity of responsible authorities	• Strict adherence to RAP prescribed activities and measures. • Provision of sufficient information to communities and ensuring the proactive participation of the affected population in the resettlement process (if necessary). • Appropriate care and respect to the resettlement of affected people (many who may be infirmed or elderly) to reduce the traumatic experience of moving (if necessary). • Ensure the necessary institutional capacity of responsible authorities/stakeholders involved in the expropriation/compensation and resettlement affairs.	• MARD	• Prior to construction	• Training course for GoA officers ~USD5,000
Employment	• Large amount of existing unemployment	• Maximise/ prioritise employment opportunities for local people in the areas of I&D scheme rehabilitation	• MARD with cooperation of the Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract

Table 10-2: Environmental and Social Mitigation Plan for I&D Scheme Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
Agricultural Disruption	• Disruption of crops and livestock production by construction activities	• Give farmers early warning of potential disruption • Provide for compensation to affected Farmers	• MARD • with cooperation of the Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract
Disruption of Access	• Disruption of existing access to I&D areas due to construction	• Build all roads to all weather standard • Construct additional pedestrian and livestock crossings as needs become apparent	• Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract
ENVIRONMENTAL FACTORS					
Fish	• Barriers to fish passage • Fish entrainment in canal system	• Ensure flows in perennial rivers and keep irrigation channels clear • Build all structures to comply with fish pass criteria (if on perennial river)	• Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract
Flora	• Loss of indigenous vegetation due to rehabilitation construction works.	• Develop nursery for indigenous plants so that there is a wider variety (in terms of maturity) of planting available for affected areas and areas designated for landscaping.	• Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract
Flora	• Introduction of Invasive Species	• Keep all construction equipment and vehicles clean and wash in safe location to prevent seed dispersal	• Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract
Soils	• Damage to soil structure due to material storage, construction traffic, etc • Loss of topsoil during excavation works. • Erosion due to uncontrolled surface run off and wastewater discharge:	• Protect non-construction areas, avoid work in sensitive areas during highly adverse conditions, restore damaged areas • Strip topsoil as necessary and store, replace/reuse post construction • Design drainage +disposal facilities to ensure soil stability.	• Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract
Soils and Water Management	• Impact of vertisols (clay heave) on structures	• Construct all structures to resist heave	• Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract
Land	• Damage to land during construction, landslides on embankments, hillsides etc. • Impacts from excavation for disposal of soil and other materials.	• Protect non-construction areas. • Design works to minimise land affected. • Design slopes to and retaining structures to minimise risks, provide appropriate drainage, soil stabilisation/vegetation cover.	• Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract

Table 10-2: Environmental and Social Mitigation Plan for I&D Scheme Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
Water Resources and Water Quality	• Interruption of surface drainage patterns during construction, creation of unsightly areas of standing water • Contamination/pollution by construction, human and animal waste, including fuel and oil spills, hazardous waste, wastewater etc	• Undertake careful design, maintain natural drainage where possible, and provide suitable wastewater drainage, • Safe and sanitary disposal of any hazardous wastes. • Wash construction vehicles and machinery only in designated areas where runoff will not create pollution and set up sediment traps • Adequate protection from / control of livestock, agriculture, casual human contact, hazardous materials – fuel oil etc (including suitable storage) • All oily waste to be collected separately	• Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract
Erosion and landslides	• Erosion in Command Area due to clearing/excavation operations	• Vegetate all soil surfaces exposed during construction at first opportunity • Use material for restoration of degraded areas • Provide slope protection through bank compaction rip rapping • Ensure irrigation infrastructure is designed to prevent erosion and gulley formation	• Contractor	• Towards end of construction	• Include under works contract
Air Quality	• Dust and fumes during construction/ rehabilitation activities	• Control dust with water spraying, control construction methods and plant, • Fit covers/tarpaulins to lorries • Schedule work during more socially amenable times. • Ensure all septic tanks/ latrines are hermetically sealed • Control vehicle speeds in surrounding/ residential areas. • Prohibit burning of construction/waste materials on site • Ensure local community is kept fully informed about the rehabilitation construction activities and blasting routines (if found necessary)	• Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract
Acoustic Environment	• Noise disturbance from construction works and traffic (if near houses) • Also disturbance to animal	• Time work to minimise disturbance. • Appropriate construction methods + equipment with covers to generators • Restrict through traffic in residential areas. • Careful siting and/or design of long term construction plant, • Provide noise baffle barriers i.e. embankments, tree bands.	• Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract • Generator cover around Euro 200/ unit
Historical / Cultural Sites	• Disturbance or degradation to known cultural sites (considered unlikely)	• Careful siting alignment of construction/ rehabilitation works. • Special measures to protect known cultural resources	• Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract

Table 10-2: Environmental and Social Mitigation Plan for I&D Scheme Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
Cultural Heritage / Chance Finds	• Irretrievable loss of heavy damage to important artefacts and historical knowledge of the surrounding area	• Early screening by Directorate of Cultural Heritage and IoA • Record including photos and filming the details of the chance find • Make modification to proposed works if the finds are not moveable	• MTCYS • IoA - Academy of Sciences • Contractor	• Throughout I&D scheme rehabilitation construction.	• To be determined can delay the works
Cultural Heritage - Graves	• Disturbance of burial places within settlements affected. (unlikely)	• Appropriate consideration to graveyard (involving re-interment) that may be affected by the inundation. This is considered very unlikely as I&D schemes are existing facilities. • To be undertaken in a considerate manner with full discretion and respect to the affected families and relatives.	• To be determined	• Prior to construction	• To be determined
Solid Waste	• Minimize disturbance from Solid Waste disposal • Prevent pollution to groundwater and animal health risk	• Mitigate and prevent against solid waste pollution during construction phase • Construction workers to be properly briefed regarding garbage disposal and protection of the environment. • Organise appropriate refuse collection and disposal regime	• Contractor	• Throughout I&D scheme rehabilitation construction.	• Include under works contract • Waste management fee about Euro 70/yr • Bins about Euro 140 each x 14 • Septic tank about Euro 1500 each
Completion /Operation Phase					
SOCIAL – ECONOMIC FACTORS					
Economy	• Maximize economic benefits due to I&D scheme function	• Increase potential for irrigation, flood control, water supply and corresponding communities enjoying an improved standard of living. • Also important to assess the potential for improved groundwater, surface water management (especially downstream) due to the altered flow regimes (if relevant)	MARD	• At the start of operation	• To be determined
Infrastructure	• Degradation of existing infrastructure in the area	• Improvement to ancillary infrastructure associated with irrigation to enable maximum benefit to be obtained from local communities and consequent improvement in the standard of living of the indigenous inhabitants by the constructing new roads, improved tourism, and a road network to camps for improved eco tourism. • upgrading recreation and sanitation facilities such as water supply and sewerage systems, water service networks and landfills etc	MARD	• At the start of operation	• To be determined • Upgrading of WSS services to be linked with existing GoA policy
Benefits and Equity	• Inequitable distribution of benefits • Women not fairly represented	• Train women during operation for I&D roles • Ensure women are fully represented in WUAs	• MARD • Municip/WUOs	• Throughout operation	• To be determined

Table 10-2: Environmental and Social Mitigation Plan for I&D Scheme Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
Constraints between users of water from reservoirs	• Conflicts between users of reservoir waters (irrigation board, hydropower administrators, fishery)	• Sign an agreement with the range of operations and their rights between main actors, where responsibilities and rights to be clearly defined) • Involve RBC and ME to ensure water resources are managed in an equitable way.	• MARD • DID, RBC • MTE	• Before starting the operation	• Not additional direct costs
Social/ Recreational activities along the river	• Sudden inundation downstream due to unforeseen natural flood events	• Introduce flood warning system downstream of reservoirs	• MARD •	• At the start of operation	• To be determined but depends on the extent of habitation downstream.
Damage of agricultural products	• Contamination of agricultural soils or soil degradation using inappropriate waters	• Interrupt irrigation in case of contamination • Control pollution sources • Ensure appropriate water quality for irrigation	• MARD •	• At the start of operation and in dry season	• To be determined by technical team
Human Health	• Exposure of farmers and labourers to pesticide and other hazardous substances	• Provide training on the risks, hazards, safe practices for handling, storing, using and disposal of pesticides. • Provide training in sustainable pest management based on IPM approach	• MAFCP • MARD • (QTTB training centres)	• Throughout operation	• To be determined
ENVIRONMENTAL FACTORS					
Biodiversity Flora and Fauna	• Loss of some fish spawning grounds and other aquatic fauna/flora due to low flow regimes	• Control of illegal gravel extraction and limited licensing for gravel extraction on perennial rivers • Integrating low flow release strategies into I&D schemes and operation protocols/management RBMP plans	• DID • Irrigation operator	• To be determined	• To be determined
Water Quality And Agrochemical pollution	• Reduction in irrigation water quality (high salinity) • Water quality problems for downstream users. • Eutrophication due to excessive fertilizer and pesticide use • Danger to farm animals	• Define and enforce irrigation return water quality levels (including monitoring) to ensure compliance with OP 4.09 • Grow crops with higher saline tolerance. • Build separate disposal channels for irrigated water. • Establish evaporation ponds to capture/contain pollutants • Raise awareness and promote IPM approach, strengthen monitoring capacity • Raise awareness on the risks, hazards, and safe practices for handling, storing, using and disposal of pesticides	• MAFCP • MTE • DID • EPA • IPH	• Throughout operation	• To be determined
Sedimentation	• Sedimentation of I&D channels.	• Construction of small-scale weirs/sediment traps in the upper catchments to trap earth and sands caused by heavy rainfall and subsequent removal. • Periodically flush I&D channels with irrigation reservoir water sufficient to distribute sediments evenly downstream.	• MARD • Irrigation operators	• Throughout operation	• To be determined

Table 10-2: Environmental and Social Mitigation Plan for I&D Scheme Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
Soils	• Erosion of top soil after construction	• Re-cultivated exposed surfaces (using native vegetation) immediately after completion of rehabilitation work. • Encourage soil deposits from excavation/ extraction works to be re-used in the vicinity of the works either for landscaping works by the Contractor or by local farmers, inhabitants, community etc.	• Contractor • MARD • Irrigation operators	• During defects liability period • At the start of operation	• Under contract • To be determined
Soils and Water Management	• Inefficient water use • Inadequate drainage	• Convert to alternative irrigation technology such as sprinkler or drip irrigation (both more expensive than gravity) • Prioritise drain maintenance by municipality/WUA • Implement water management measures upstream	• MARD • Irrigation operators	• Throughout operation	• To be determined
Soils, Salinity and Water Management	• Groundwater rise/fall • Secondary salinization • Disturbance to traditional groundwater supplies	• Convert to alternative irrigation technology such as sprinkler or drip irrigation (both more expensive than gravity) • Consider water fees based on volume instead of irrigated areas. • Apply acidifying fertilisers if salinization is non sodic and leach with surface water • Enforce adequate drain maintenance by WUA • Apply good irrigation water management protocols and routines • Assess the water supply needs of the poor/disadvantaged people	• MAFCP • Irrigation operators • Municipality/WUAs	• Throughout operation	• To be determined
Soils and Water Management	• Decline in soil fertility • Impact of vertisols (clay heave) on structures	• Research and develop cross specific fertiliser recommendations and provide easy access to inorganic fertilisers • Inspect and maintain all structures	• MAFCP • Irrigation operators • Municipality/WUAs	• Throughout operation	• To be determined
Erosion	• Erosion in command area and sedimentation from upstream	• Maintain vegetation on all soil surfaces originally exposed and re-vegetated by contractors • Promote use of erosion tolerant grasses (vetiver grass) • Ensure the main drainage channels are fully maintained • Ensure vegetation established around all new structures • Periodically flush out /dislodge sediment with irrigation reservoirs water.	• Irrigation operators • Municipality/WUAs	• Throughout operation	• To be determined

Table 10-2: Environmental and Social Mitigation Plan for I&D Scheme Rehabilitation

Topic/ Indicator	Possible Impact	Mitigation Measures	Responsibility	Schedule	Cost
Pests, diseases improper use of pesticides	• Crop losses and contamination from pesticides • Impacts to non-target organisms (i.e. birds) natural predators for pests	• Promote organic agriculture • Target research on pest and diseases • Raise awareness to pesticides and promote IPM approaches • Introduce training in risks and hazards and safe practices for handling, storing, using and disposal of pesticides and also in sustainable pest management based upon an IPM approach. • Strengthen internal capacity for pest management • Improve monitoring and evaluation	• MARD • National food agency • QTTB training centre • Institute for Public health	• Throughout operation	• To be determined
Fish	• Fish entrainment in canal system • Impact of water pollution on fish	• Ensure flows in rivers and keep irrigation channels clear • Use separate drains for irrigation return water	• Irrigation operators • Municipality/WUAs	• Throughout operation	• To be determined
Livestock Husbandry	• Conflicts between livestock and arable farmers.	• Establish corridors between I&D fields and pasture	• Irrigation operators • Municipality/WUAs	• Throughout operation	• To be determined

- Define the role, competencies and responsibilities of local government units (municipalities) in I&D management as a way to improve sector performance. This role may involve:
  - the transfer of right to use a substantial portion of infrastructure (small and medium reservoirs, second and third channels of irrigation and drainage etc.) and transfer of responsibility for operation and maintenance of net transfer of infrastructure;
  - Promoting the establishment of WUO, by being an integral part of their management structures and support for strengthening and functioning of the WUO;
  - Fixing the irrigation service fees / drainage and collection aiming at a gradual coverage of the costs.
- Mobilizing financial resources from other units of local government itself or securing grants from the state budget based on needs.

Improving the institutional plan of I&D management at three levels
- Central Government including the MARD and Directorate of Irrigation and Drainage as senior management level.
- Municipality as the middle management level.
- WUO and their unions as the lower level of administration, when these are effectively set up and operate properly.

Define the role of Directorate of Irrigation and Drainage/municipality (as owner):
- Define responsibilities for municipalities for the management of infrastructure that has passed the ownership of the local government
- Define responsibilities for municipalities for the management and maintenance of irrigation channels of the second and third level and third channels draining.
- Define responsibilities for WUO for the administration and maintenance of irrigation canals after the third level of their creation and consolidation.
- Improvement of legislation in terms of responsibilities that have the Directorates of forest management for forests and high water channels and the Directorates of the Fisheries for the use of lagoons and irrigation reservoirs for fishing.
- Forecasting policies for stimulating and supporting the well-functioning of WUO.

10.2.2 Environmental Protection improvements to water basin use

Considering that the EIA process helps to generate useful information regarding environmental impacts, mitigation measures, monitoring process etc., to the public and decision makers, the EIA quality should be improved, by avoiding academic descriptions or using general and ambiguous terms that are not really related to the real impacts. The following points could help to improve the quality of EIA:

- The REAs and MTE can stipulate in the ToR in more detail for particular EIAs, the need to initiate a full country monitoring on parameters such as air, surface waters quality, pesticide use etc. Although this may increase the cost of the EIA, such as policy, can help to upgrade and improve documentation regarding environmental quality and will facilitate much better future evaluation by comparison of existing environmental status with different stages of development.
- Unification and certification of more chemical laboratories, and training of the new generation of chemists on laboratory analyses.
- Increase the authority and responsibility of REA and Directorate of EIA in the MTE, to avoid low quality EIA reports.
- Only consultancy entities, with at least three in-house experts, to have the right to prepare the EIA (profound and generic category) reports, instead of individuals.
- To open the relevant EIA evaluation offices in the Governmental bodies, that has the right and the

authority to implement important development actions that can affect the environment (MTE, MARD, Municipalities etc. Training of the EIA evaluators (officials) on EIA and monitoring process.
- Improve the documentation and information system regarding EIA process and reports.
- Implement a realistic monitoring system, using GIS technologies that will help avoid obtaining spurious and fictitious information.

10.3 Environmental Monitoring Plan

Monitoring and supervision arrangements should be agreed by the WB and the Borrower to: ensure timely detection of conditions requiring remedial measures in keeping with good practice; furnish information and the progress and results of mitigation and institutional strengthening measures; and, assess compliance with national and Bank safeguard policies.

10.3.1 Monitoring Objectives

The aim of the monitoring is to establish appropriate criteria to verify the predicted impact of the WRIP Project and to ensure that any unforeseen impacts are detected and the mitigation adjusted where needed at an early stage.

The monitoring undertaken will need to keep relevant records to ensure compliance with recommended environmental procedures. The plan will ensure that mitigating measures and impacts of the project during construction (upgrading the dams and I&D schemes and operation and maintenance) and operation phases are implemented. It is important that adequate funds will be provided for this purpose during the construction and operation phases of the Project. Specific objectives of the monitoring programme are therefore to:

- Check the effectiveness of suggested mitigation measures;
- Demonstrate -that the project activities (pre-construction, construction and operation) are carried out in accordance with the prescribed mitigation measures and existing compliance regulatory procedures; and
- Provide any early warning signals whenever an impact indicator approaches a critical level.

The "Impact Indicators" are defined in terms of carrying capacity, threshold levels, and regulation and enforcement standards. Implementation of the EMoP will therefore allow the relevant stakeholders to potentially control and manage the timing, location and level of impacts and potentially provide the cause and effect data for the empirical verification or validation of various predictive models of action/impact relationships.

Construction Phase
The aim will be to assess the mitigation measures for noise and vibration, water and air quality issues and public safety using visual assessment by the management and feedback from the other stakeholders. Where pollution is suspected sampling and laboratory analysis should be conducted to determine its nature and extent.

Operation and Maintenance (O&M) Phase
The monitoring plan at this phase will ensure that the negative impacts of the O&M of the dams and I&D schemes are reduced to a minimum level as possible. This will guarantee the health and safety of employees (particular during the construction phase) and the general public (throughout all phases).

10.3.2 Monitoring Requirements

A monitoring program requires a number of components to ensure effective results. These include:

- Relevant baseline data against which to monitor project results;
- Verifiably, clear and objective indicators for each project and project component for which monitoring will be conducted;
- An independent/unbiased body responsible for monitoring;
- A clear capacity for monitoring;
- Monitoring on a regular basis with a sufficient operational budget that is able to provide meaningful results;
- An effective monitoring reporting mechanism including feedback and commitment to action on-monitoring results and recommendations.

10.3.3 Monitoring Procedure and Plan

The EMoP will comprise a long term monitoring strategy and this will encompass clear and definitive criteria and parameters to be monitored for each individual sub-project (dam, reservoir, ancillary works and I&D schemes).

The EMoP will take into consideration the scope of development, environmental and social sensitivity and the financial and technical means available. The EMoP will identify and describe the indicators to be used, the frequency of monitoring and the standard (baseline) against which the indicators will be measured for compliance with the ESMP.

It is proposed that monthly monitoring plans could be prepared by the appropriate stakeholders. These plans will define the specific issues to be monitored including, the natural habitat, land use, soil/water, and social impacts. It is proposed that regular monitoring should take place throughout the life of the project. Table 10-3 and Table 10-4 provide an indication of the variables that will be monitored, possible indicators to consider, baseline data to consider, and linkages with other variables.

Monitoring reports (perhaps quarterly and annual reports) should be submitted to the relevant stakeholder and to other appropriate state environmental protection agencies (EPAs/REAs). All these monitoring components should be subject to internal audit by the relevant and responsible stakeholder. Each monitoring programme will follow the established schedule; monitoring may be performed daily, weekly, quarterly, semi-annually, annually, biennially, or continuously, depending upon the resource, regulatory requirements for regulatory monitoring, and the project-specific requirements for other monitoring.

Table 10-3: Monitoring Variables, Linkages, Indicators and Baseline Data to be considered

Monitoring Variables	Linkages	Indicators to be Considered	Baseline Data to be Considered
Environment			
Habitat	Rare and endangered species	Area and quality of habitat	
Flora		Populations of important flora	Current species list and numbers
Fauna		Populations of important fauna	Current species list and numbers
Wetlands	Importance of flora and fauna for flood control and provision of goods and services to local communities	Area of wetlands and numbers; integrity of wetlands providing goods and services	Inventory of wetlands, number and size, hydrological cycles and downstream effects.
Fishery Resource			
Populations	Community economic needs; water quality and quantity	Population size and off take	Current population and off take
Species composition	Ecosystems health; water quality and quantity	Species mix	Current species mix
Cultural Resources			
Cultural Sites	Cultural and social systems and community needs	Sites remaining	Inventory of sites
Social Systems	General community and individual member satisfaction	Community social structure	Current social structure and important aspects of structure

Monitoring Variables	Linkages	Indicators to be Considered	Baseline Data to be Considered
Water Resource			
Groundwater quality	Health, crop production, desertification	Quality of water (chemical composition)	Current chemical composition
Groundwater quantity	Health and irrigation	Depth and yield	Current depth and yield
Surface water quality	Health, natural habitats, flora and fauna, irrigation	Quality of water (chemical analysis/ indicator species of water quality)	Current chemical composition flora and fauna inventory (i.e. macro invertebrates, micro invertebrates, micro flora) Fertiliser Use – amount of dosage and timing of application
Surface water quantity	Health, crop production	Yield and flow (seasonal) Number of obstruction in canals	Current yields and flows in different seasons
Soil Resources			
Soil erosion	Crop productivity, irrigation and cultivation techniques, watering points, livestock management	Sediment loading Depth of siltation in canals	Sediment loads
Soil quality – chemicals	Pesticide use	Chemical analysis of soil	Chemical analysis of soils
Soil quality – water logging	Irrigation drainage	Soil analysis, crop production Soil salinization	Soil analysis, crop production on controlled plots where possible, Reductions in crop productivity Fertiliser use
Air Quality			
Scrub burning (swaling[20])	Crop production, forest harvesting	Number of fires and areas burned	Current level of fires and areas burned.
Dust generation construction activity	Health, nuisance value	Dust levels in the atmosphere	Existing dust levels
Noise			
Noise generated by construction activity	Health, nuisance value	Noise levels	Existing background noise levels
Health			
HIV/AIDS	Potential increase due to the project	Incidence of HIV/AIDS through clinic records	Existing levels of HIV/AIDS
Water borne diseases	Drainage and irrigation	Health statistics/local clinics	Status of health regarding water borne diseases
Other Social			
Economic need from other natural resources (forestry, fishery etc.)	Irrigation, drainage conflicts	Harvest results, population size, area under forest cover, forest stand condition	Fishery population by species, forest stand volumes and areas
Conflicts	Land and water resource use	Number and nature of conflicts	Current conflict levels, and number observed from WRIP

Table 10-4: Cumulative Impacts -Monitoring Indicators and Possible External Factors

Impact	Indicators	Contributing External Activities
Loss of Habitats	Total area and number of important habitats	Urbanisation, road development, agricultural development other capital project development
Loss of Wetlands	Area and number of important wetlands	Irrigation and drainage projects
Groundwater Quality	Chemical composition	Industrial pollution (effluent discharge); use of fertilisers and pesticides and other agricultural activities
Groundwater Quantity	Extraction rates and depth of water table	Industrial and other municipal extractions
Surface Water Quality	Chemical composition – biotic community	Effluent discharge from municipalities and other industrial complexes Fertiliser and Pesticides use
Surface Water Quantity	Flow rates	Extraction for power, irrigation schemes, industrial and domestic use
Air Quality	Chemical composition	Industrial air emissions, high volume and high concentration of vehicular traffic
Health : HIV/AIDS	Reported cases at clinics	Infrastructure activities affecting outside workers; other

[20] Swaling is the annual burning of the gorse and scrub in order to thin out the old vegetation in to allow new grass shoots to grow thus providing grazing for livestock.

Impact	Indicators	Contributing External Activities
		new development; expanding urban areas
Health: Waterborne Diseases	Reported cases at clinics	None apparent
Conflicts	Number of documented conflicts and nature and seriousness of conflicts	Any other development activity planned and implemented in absence of full participatory planning

10.4 Organisation of Monitoring

The implementation of the dam safety construction and I&D schemes rehabilitation under WRIP will need to be monitored responsibly and in accordance with the Albanian legislative requirements currently in force, as well as in accordance with the relevant WB OPs.

The Environmental Monitoring Plan/Programme (EMoP) needs to be considered by the stakeholders. The EMoP is subdivided into socio-economic and environmental issues, but as the monitoring indicators essentially remain the same during the pre-construction, construction and operational periods of the project development they are listed together and are assumed to be necessary during all three periods or phases (*Table 10-5*).

The Consultant has also provided on the EMoP the impact, parameter, indicator, monitoring methodology, frequency, and broad indications of responsibilities although more consultation between the different stakeholders will be required prior to implementation; and finally cost or indication where costs would be applied. Many of the costs are not shown at present as it needs to be confirmed who is responsible during the preconstruction, construction and operational periods of the development; for example some monitoring can be covered within the existing contractor budget (covered under the WRIP), but it will need to be ascertained how monitoring will be extended beyond construction.

Current responsibility for monitoring of indicators is split between many different stakeholders and also at national and municipal level. The Environmental Protection Agency under MEFWA (EPA/REA) in Albania will play a prominent role in the setup of the monitoring plan for the project. MAFCP, MEFWA/REA need to decide what elements of monitoring are the contractor's responsibility and those that should be integrated into the national monitoring program for environmental status. There will be a need to get answers to the following questions:

- Do the current communes or regional agencies have a budget for monitoring activities?
- Who is responsible for monitoring social indicators?
- Who will be responsible for funding the monitoring?
- Should the Contractor include the costs for monitoring in tenders?
- Will the monitoring be outsourced to a private company?

Table 10-5: Environmental and Social Monitoring Plan

Impact	Parameter	Indicator	Methodology	Frequency	Responsibility	Cost
SOCIAL / ECONOMIC						
Water Borne Diseases	• Disease prevalence	• Increased cases of water borne diseases	• Review of health records	• Quarterly	• MARD • Public Health Institute	• Covered under WRIP up to construction • GoA budget during operation
Safety Hazards	• Safety to Humans and Livestock	• Reported cases of incidences and accidents • Colour, turbidity and change in seepage chemical content • Pesticide occurrence in foodstuff	• Review and evaluation of incidents and accidents register • Direct observation of seepage water • Instrumentation	• Continuous/ periodic monitoring through instrumentation	• Contractor • MARD • National Food Agency and Regional Inspectorates	• Covered under WRIP up to construction • To be determined during operation
Earthquakes	• Safety to Humans and Livestock	• Outputs from seismograph stations • Seepages and leakages reported or observed on the dam	• Instrumentation equipment including; Accelerograph, survey theodolite etc	• Continuous monitoring through instrumentation	• MARD • GeoAlba	• To be determined
Economic Development	• Agricultural production	• Crop tonnages • Fertiliser Use	• Take from INSTAT and MAFCP records	• Annual	• CEIA undertaking Baseline survey • MARD •	• Covered under WRIP up to construction. • GoA budget during operation
Economic Development	• Employment	• No of employed • No of unemployed	• Ascertain current levels and structure of employment in Project area	• Annual	• CEIA undertaking Baseline survey • MARD •	• Covered under WRIP up to construction. • GoA budget during operation
Economic Development	• Current tourism in project area	• number of tourists • Occupancy of Hotel	• Take from INSTAT records	• Annual	• CEIA undertaking Baseline survey • MARD •	• Covered under WRIP up to construction. • GoA budget during operation
Economic Development	• Fishing and Hunting permits issued in project area	• No of tourists	• Take from MEFWA records	• Annual	• CEIA undertaking Baseline survey • MARD •	• Covered under WRIP up to construction. • GoA budget during operation

Impact	Parameter	Indicator	Methodology	Frequency	Responsibility	Cost
ENVIRONMENTAL						
Water Pollution	• Groundwater Quality • Surface Water Quality	• Nutrient Load (Nitrates, phosphates, potassium, pesticide residue, COD & BOD, Turbidity • Pesticides • Oil contamination (PAH)	• Bi-Annually during wet and dry season (samples should be taken from the inlet and outlet points of the developed area	• Seasonally	• ME (Environmental Protection Agency) • Institute for Public Health • Institute of oil research, Fier •	• 50 USD per sampling and analyses on nutrient load • USD 50 per sample for pesticides • 500 USD for sampling and analyses of oils
Reduced Water Flow (only if concerned perennial stream	• Quantity of water	• Flow rates per second	• River Stream Gauging	• Seasonally	• ME (Environmental Protection Agency)	• Not defined
Soil erosion	• Soil cover loss	• Soil productivity, gulleys, water turbidity	• Observation	• Continuous	• MARD •	• No additional cost
Flooding	• Area inundated	• Floods downstream of project area	• Observation and reported cases of flooding	• Continuous	• MTE(Environmental Protection Agency)	• No additional cost
Water wastage	• Water availability	• Insufficient water amount for irrigation purposes, compares with volumes expected	• Install water meters	• Continuous	• MTE (Environmental Protection Agency) • DIDs	No additional cost
Loss of Biodiversity	• Flora and Fauna	• Populations of important flora and fauna	• Observation	• Seasonally	• ME (Environmental Protection Agency)	• Not defined

11 INSTITUTIONAL ARRANGEMENTS - CAPACITY BUILDING

This section defined the responsibilities for mitigation and monitoring along with arrangements for information flow, especially for coordination between agencies responsible for mitigation; e.g., for enforcement of remedial actions, monitoring of implementation, training, financing, and reporting.

The proposed WRIP responds to requests from MARD and DSDC, and integrates strategic support for IWRM and institutional support and investments in the rehabilitation of reservoirs and associated irrigation and drainage infrastructure, to be implemented by MARD. The WRIP is being undertaken using World Bank financing in the form of a loan.

The roles and responsibilities of different levels of government and stakeholders have been described in earlier sections of this ESFD. The institutional arrangements proposed for the successful mainstreaming of the environmental and social considerations are as follows:

- MARD need to ensure that they have the necessary staff allocated for the project once the construction starts and to ensure that the mitigation measures proposed within the site specific ESMPs are included in the bidding document, including the Bill of Quantities, and that a specific budget is allocated for implementing the mitigation measures.
- The project's physical infrastructure (dam rehabilitation and I&D works) will be built by contractors commissioned through a tender process. During the construction period and defects liability period, the contractor will be supervised, on behalf of the MARD, by a supervision engineering consultant (SEC).
- When the dams have been rehabilitated and the irrigations schemes have been commissioned the respective DIDs/municipalities will take over operation and maintenance on behalf of the MARD.

11.1 Training

A key component of the success of the ESMP depends of effective capacity building of the MARD, the training of staff and all others stakeholder organisations involved in the ESMP, including the rehabilitation of construction contractor, and the SEC which is planned under WRIP Component 2 Item B. It is proposed that these activities could be assisted by the implementation of technical assistance (TA) from outside consultants on an as required basis.

It is obvious that all those responsible for the management, implementation and operation of any aspect of the different Site Specific ESMPs shall be adequately trained for their role. It is proposed that training records should be kept for all stakeholder employees, to provide evidence for auditing/inspection purposes. This is considered a very useful indicator of the overall project achievements.

The following training can be considered for the following organizations.

11.1.1 Ministry of Agriculture and Rural Development

The MARD will provide an Environmental Engineer (reassigned from another department) to oversee the preparation, implementation and oversight of the ESMP and its associated sub plans (e.g. EMiP and EMoP) as the WRIP progresses and beyond, perhaps assisted by an independent environmental monitoring consultant (see below). MARD could consider utilising some of the allocated budget under WRIP Component 2 part B for this.

At present, Albania's strategy on PPP focuses specifically on trade, use, storage, transport and disposal of pesticides and as such falls short to provide comprehensive guidance on integrated pest management. In

view of EU accession, the GOA intends to prepare a more comprehensive strategy on IPM that would reflect guidance from the EU Framework Directive on Sustainable Pest Management. In the absence of an Albania IPM strategy, specific activities to promote IPM will therefore derive their inspiration from the EU Directive, until an Albania IPM strategy is in place.

Within the context of its objectives and activities, WRIP will contribute to supporting the strategy on PPP and measures to promote IPM by providing training to farmers/WUOs, DIDs and municipalities as part of its overall training program. WRIP will not provide support for the preparation of the IPM strategy. The training curriculum will include a number of themes related with the risks and hazards and safe practices for handling, storing, using and disposal of pesticides, and also in sustainable pest management based on an IPM approach. The provisions for this training will be described in more detail in the Pest Management section of the Site Specific ESMP for I&D schemes.

The training curriculum will include the following issues:

- IPM strategies and techniques,
- Integrated crop management strategies and techniques,
- Organic farming principles, biological pest control methods,
- Information on the general principles and crop or sector-specific guidelines for IPM.

Furthermore specific IPM training can be extended to include the prevention and/or suppression of harmful organisms by:

- crop rotation,
- use of adequate cultivation techniques (e.g. sowing dates and densities, under-sowing, conservation (zero) tillage, pruning and direct sowing),
- use, where appropriate, of resistant/tolerant cultivars and standard/certified seed and planting material,
- use of balanced fertilisation, liming and irrigation/drainage practices,
- preventing the spreading of harmful organisms by hygiene measures (e.g. by regular cleansing of machinery and equipment) and
- protection and enhancement of important beneficial organisms, e.g. by adequate plant protection measures or the utilisation of ecological infrastructures inside and outside production sites

The Environmental Engineer should be provided with enough technical and financial resources to complete this training role; external resources through TA may be required on occasions. Specific training for the Environmental Engineer could include the following:

- Principles and procedures for environmental impact assessment;
- Fundamentals of environmental management;
- Compliance assessment, monitoring and follow-up;
- Environmental audits;
- Social impact assessment and public consultation; and
- Trained expertise in water quality testing and analysis.

11.1.2 Supervising Engineering Consultant

The SEC hired for the supervision should have environmental staff trained to ensure contractor compli-

ance with ESMP requirements. Alternatively, the SEC can sub-contract this responsibility to adequately trained personnel on the approval of MARD. Training records, including attendance and specific course, shall be maintained for inspection by MARD. Specific training to the environmental staff within SEC should be provided as follows:

- Principles and procedures for environmental impact assessment;
- Fundamentals of environmental management;
- Compliance assessment, monitoring and follow-up;
- Air, soil and water sampling procedures;
- Construction impacts, including civil works, sediment and erosion control, soil handling and vegetation removal;
- Waste management;
- Fuel and hazardous materials management;
- Fundamentals of aquatic ecology ;
- Construction camp management; and
- Auditing and follow-up

11.1.3 The Rehabilitation Construction Contractor

The rehabilitation construction contractor (RCC) shall have environmental staff trained to ensure contractor and all subcontractor compliance with ESMP requirements. The RCC shall maintain training records, including attendance and specific course, for inspection by the MARD. Specific training to the RCC environmental unit should be provided as follows:

- Fundamentals of environmental management;
- Compliance assessment, monitoring and follow-up;
- Air, soil and water sampling procedures;
- Construction impacts, including civil works, sediment and erosion control, soil handling and vegetation removal;
- Waste management;
- Fuel and hazardous materials management;
- Construction camp management;
- Community relations and public consultation procedures; and
- Auditing and follow-up.

11.1.4 Independent Environmental Monitoring Consultant

The Independent Environmental Monitoring Consultant (IEMC) should be trained in the oversight and compliance assessment of dam rehabilitation and I&D infrastructure projects, including the preparation of compliance reports and environmental sampling procedures, including the following:

- Principles and procedures for environmental impact assessment;
- Fundamentals of environmental management;
- Compliance assessment, monitoring and follow-up;
- Air, soil and water sampling procedures;
- Construction impacts, including civil works, sediment and erosion control, soil handling and vegetation removal;
- Waste management;
- Fuel and hazardous materials management;
- Construction camp management;
- Community relations and public consultation procedures; and

- Auditing and follow-up

11.1.5 Technical Assistance

In addition to staff training, technical assistance using outside consultants has been included into the training budget. Technical assistance could be full-time onsite within the MARD or include short visits by outside consultants to provide training seminars and workshops etc.

Training costs are estimated in Chapter 13.

12 IMPLEMENTATION PLAN - REPORTING PROCEDURES

12.1 Implementation Schedule

The timing, frequency and duration of mitigation measures and monitoring should be included in an implementation schedule, showing phasing and coordination with procedures. After referring to the Feasibility Study (FS) prepared by Mott McDonald, the maximum period planned for construction taking into consideration the different options is no more than 12 months (for Murriz Thana) with the majority being estimated to last for about 3 to 6 months.

Notwithstanding, it is important that the works are carefully timed to ensure that works that could affect stability are carried out when the reservoir has been drawn down, and there is limited rainfall expected (i.e. work in the driest season). When works are required at the outlet, there will be no diversion and this will need to be carefully timed. The weather is also a significant consideration, with earthmoving works and other works avoided during the wetter months.

The FS do not actually specify any date for start-up of the dam and I&D schemes rehabilitation works, but they give indications of preferred months of operations due to the reasons outlined in the previous paragraph. In order to obtain an implementation schedule Figure 12-1 shows the current thinking on the dam rehabilitation construction works schedule and indicates that works for construction would continue throughout 2013. Of course such a schedule needs to be confirmed by the relevant stakeholders and MAFCP may wish to only schedule a few of the dams over a number of years. It is assumed these issues will become more concrete after comments are received to the FS.

12.2 Reporting procedures

12.2.1 Construction

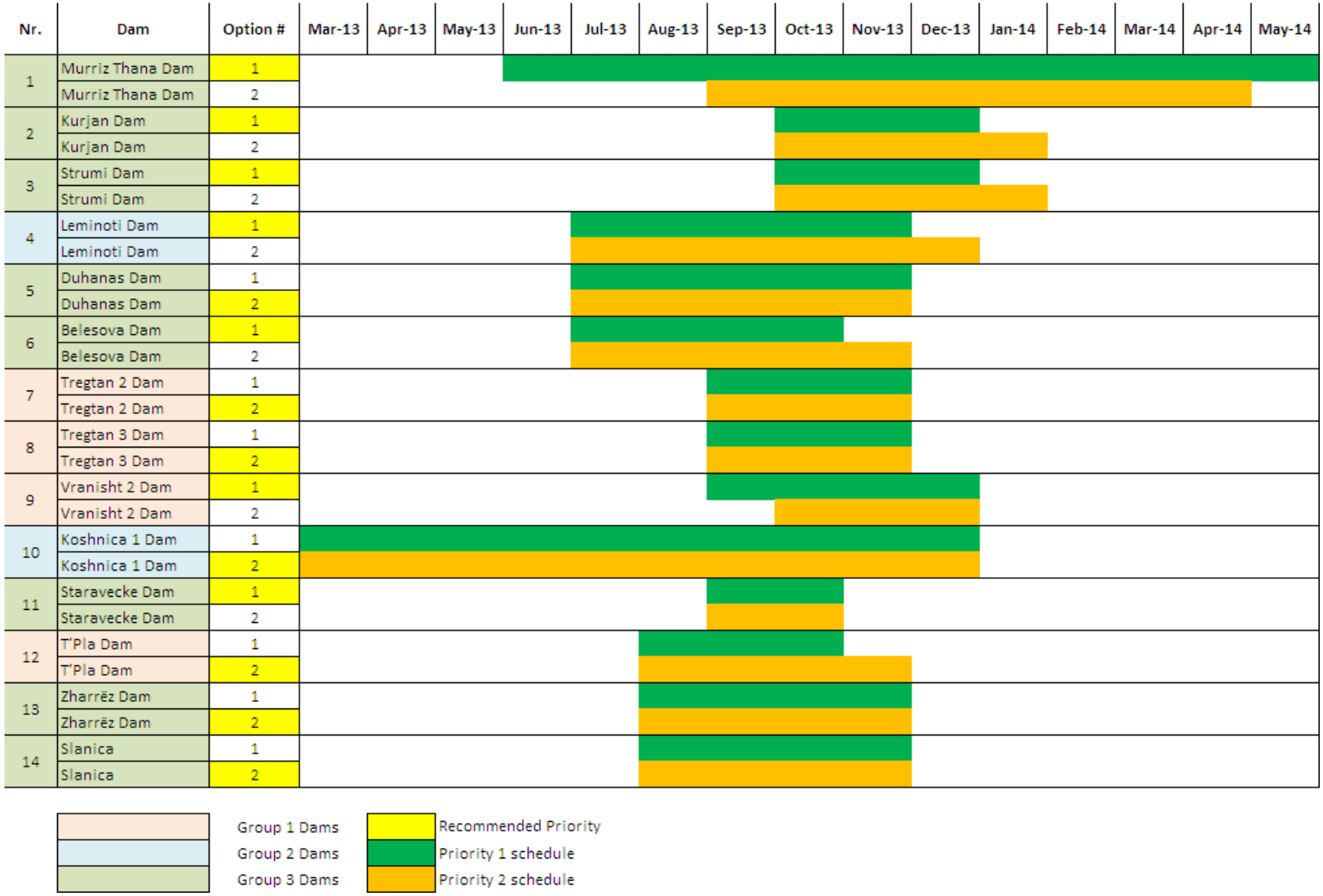
Ultimately, the Contractors for the dam and I&D schemes rehabilitation, in accordance with the Contract provision, will be accountable for the implementation of the majority of the mitigation measures during the construction phase.

In the schedule of works, the Contractors must include all proposed mitigation measures, and the Supervising Engineers should also ensure that the schedules and monitoring plans are complied with. This will lend a sense of ownership to the Contractors. Diligence on the part of the Contractors and proper supervision during both the construction and defects liability period are crucial to the success of mitigating impacts. It is expected that all experts proposed for the implementation works will have appropriate certification and accreditation with the relevant Albanian Government departments and institutions.

The progress reports to be prepared by the Consultant will include data and information on health and safety (accidents and incidents), environmental protection (spill and non-compliance), labour (numbers, grades, problems), community relations (complaints, issues), and relevant training.

The supervision consultant will need to check the contractor's reports and forward them to the Employer (presumably MAFCP), including any additional records concerning implementation of the project's RAP and ESMP.

Figure 12-1: Construction Schedule from I&D Project (months taken from Feasibility Studies)



Source: Adapted from Mott MacDonald Feasibility Study

It is important that the Employer's, SEC and the Contractor's staff on site establish and maintain effective communication links between each other and other stakeholders (i.e. the communes) to ensure easy two-way flow of information.

Table 12-1 below describes the proposed lines of communication for local residents, construction workers, employees and other project-related individuals with respect to filing grievances or incidences throughout the construction and operation of the rehabilitation projects. This proposed communication pathway can be fine-tuned once the construction project commences.

Table 12-1: Proposed Communication Pathway

Type of Stakeholder	Potential Interest / Concern	Means of Contact	Key Contact
Local residents directly affected by the development works and downstream users	• Adequate compensation package (financial assistance, etc.) • Disturbance from construction camp and associated activities (alcohol, environmental issues, etc.) • Loss of productive lands, fisheries, etc. • Access to community services (medical, education, telephone, market, etc.) • Maintenance of cultural heritage • Safety and security of local villages and communes • Information broadcasts on potential hazards (blasting, road closures, reduced river access, etc.)	• Complaints/concerns shall be communicated to local village leaders and then onwards to authorities through a grievance process (Grievance Redress Mechanism that needs to be created). • Information broadcasts and project updates shall be provided by the Contractor to local residents	To be discussed
Potential Employees	• Employment opportunities • Adequate accommodation and subsistence provided • resources (food, water, etc.) and shelter • Competitive wages	• Recruitment of locals at the project site through word of mouth (give this priority) • Issues shall be conveyed to site foremen	Contractor
Government Stakeholders	• Persistent environmental and socio-economic impacts	• Monitoring committee comprising of agreed forum of members (for discussion)	To be discussed
Construction workers and camp sites	• Worker code of conduct • Social conflicts between local residents and workers • Behaviour issues (gambling, drunkenness, etc.) • Environmental issues (exploitation of natural resources, etc.)	• Weekly meetings with construction workers • Individual meeting with disorderly workers	Contractor

12.2.2 Operation

Once the irrigation dams and ancillary access roads are in operation, maintenance will be a key factor in protecting the environment. During this project operation a large number of environmentally and socially related measures and programmes will be implemented, by different organisations. Reporting on these will be un-coordinated unless a single management organisation is established to manage and track all aspects of the project. In practical terms, this would be done most easily by Directorate Of Irrigation and Drainage and Regional Environmental Agency.

12.2.3 Reporting Plan

Reports shall be produced through the course of implementation of monitoring programs during the construction and operations phases of the project and will include such things as, collecting incident/ griev-

ances forms, consulting with local residents and project-affected communes and auditing performance of existing programs/mitigation measures under the WRIP.

The MARD should provide the World Bank with report updates for the duration of the WRIP. Frequency of reporting to the World Bank and MARD will vary depending on the nature of the non-compliance and with the agreed monitoring schedule. Table 12-2 describes the types of reports that shall be produced and gives indications of the reporting responsibilities.

Table 12-2: Suggestions of External Reporting

Responsibility	Type of Report	Purpose of Reporting	Frequency of Submission	Submit to:
Contractor's HSE Officer	Accidents/ Incident Report	Filing/notification of accidents or unplanned events	Within 24 hours of the incident	MARD
	Non-compliance Report	Detail the cause, nature and effect of any environmental and/or socio-economic non-compliant act performed	Within one week of the event	MARD
	Monthly Compliance Report	Report to the Construction Engineering Consultant	Report of compliance and non-compliance measures on a monthly basis	MARD
Supervising Engineering Consultant	Daily Compliance Checklist	Checklist of environmental and social compliance of construction	Daily	Internal
	Monthly Compliance Report	Monthly report of compliance within 10 days of receipt of report from Contractor	Monthly	MARD
Independent Environmental Monitoring Consultant	EMP updates, including any changes in management or monitoring procedures	For approval prior to implementation	As required, prior to implementation	MARD
	Key changes in project activities that may trigger Environmental Approvals	Ensure compliance with environmental regulatory approvals	As required, prior to implementation	MARD
	Environmental monitoring reports	Notification of non-compliance with standard environmental guidelines and parameters	Dependent on environmental parameter: weekly, monthly, quarterly or annually	MARD Environmental Agency

13 COST ESTIMATES AND SOURCE OF FUNDS

13.1 Cost Estimates

Section 10 of this ESFD has provided some indication of costs, both in terms of initial investments and recurring expenses for implementing all the measures defined in the Plan which can then be integrated into the total project costs and factored into financing negotiations. Estimated costs for the initial implementation of the ESMP are presented below in Table 13-1. Costs have been defined on an initial set up basis and will be included where relevant into the Contractor's tender. It is proposed that MARD would revise these costs and develop annual operating costs for the ESMP on a yearly basis.

Table 13-1: Preliminary Estimates of ESMP Costs

ESMP Components	Estimate Costs USD
Contractor – ESMP measures built into contract specifications	Suggest take around, 8-12% of total construction costs According to FS Consultant Dam Rehab cost USD 10.5 million,[21] therefore:1,050,000
Supervising Engineering Consultant – environment – to be built into the contract for SEC (this includes sampling for environmental quality)	Suggest to take around 20% of engineering supervision cost (5% of construction costs Therefore USD 100,000 Plus USD 50,000 (separate estimate for environmental quality monitoring)
Independent Environmental Monitoring	Say USD 75,000 (over 3 years)
Institutional Strengthening, Training and Capacity Building • Environmental Engineer • MAFCP Pesticide section • Local authorities, communities and other stakeholders (including farmers) • On-site training • Offsite training • Local capacity building • Equipment and logistics • Awareness raising on sustainable pest management based upon an IPM approach • Risks and hazards and safe practices for handling, storing, using and disposal of pesticides	USD 250,000
Technical Assistance • Provision of outside consultants • Manual of functions and procedures • Assist in development of environmental database • Special issues – e.g. water quality with IPH testing and analysis • EMP protocols and procedures • Assist in developing IPM approach • Assist in implementation of updated management plans • Contractor liaison • TORs	Say USD 75,000 (over 3 years)
TOTAL COSTS	USD 1,600,000

[21] Total combined cost of dam rehabilitation and irrigation schemes improvements is USD 37.3 million

As mitigating costs may occur at points during project implementation, construction or operations, indications of cash flow are provided but may need to change after stakeholder review. It is important to capture all costs – including administrative, design and consultancy, and operational and maintenance costs – resulting from meetings that require changes to standards or modifications to project design.

Many of the measures in the ESMP relate to project planning and preparation, or are standard best practice during construction, as a management overhead. Therefore no costs are attributed to them in the ESMP table. Measures with identifiable costs are listed.

The total cost of the environmental and social mitigation and enhancement measures for dam safety including monitoring is estimated at USD 1.6 million over 3 years. This total excludes:

- The cost for the rehabilitation of the I&D schemes as these have not reached preliminary design
- Land acquisition and compensation, resettlement (not probably relevant), land redistribution and consolidation, and associated institutional strengthening, as well as support for vulnerable households affected by changes to land tenure - these costs are to be detailed in the RAPs – if required;
- Health measures and health monitoring - full details of these activities are to be developed by the IPH; a nominal sum of USD 100,000 has been included for health and safety during construction as well as USD 50,000 for the public awareness campaigns during construction.
- A number of measures identified as important for project success but which are not strictly environmental and social mitigation measures, including (a) capital investments, (b) enhanced support for WUO formation and operation, (c) agricultural and agronomic activities (research, extension and training, implementation of the necessary livestock, mechanisation and pest management plans, (d) contributions to regional initiatives i.e., fisheries (i.e. hatcheries), and (e) community development activities.

13.2 Source of Funds

It is assumed that the funds for paying for the activities associated with the construction phase of the project will come from the World Bank WRIP Loan. As mentioned previously, the majority of the mitigation measures and most of the monitoring for the EMSP will be integrated within the contracts for dam and I&D Scheme rehabilitation. This implies that there is funding cover during the construction. It may also be possible to include some mitigation/ monitoring in the Defects Liability Period (DLP) which is assumed to extend for 12 months beyond the completion dates for the contracts.

What is less clear and needs further discussion is how the proposed mitigation measures and monitoring intended for the operational phase of the dams and I&D schemes will be achievable and where the source of funding for this will come from.

The WRIP (Component 4 part B) provides for the establishment of a monitoring and evaluation system but only on key performance output and impact indicators.

14 PUBLIC CONSULTATION

MARD has the responsibility to effectively engage stakeholders in achieving the WRIP objectives for the benefit of all. The implementation of the WRIP overall depends on the meaningful participation of all stakeholders for success.

A public consultation plan (PCP) provides a framework for achieving effective stakeholder involvement and promoting greater awareness and understanding of issues so that the project is carried out effectively within budget and on-time to the satisfaction of all concerned.

To ensure effective implementation of PCP, the MARD should be committed to the following principles:

- Promoting openness and communication
- Ensuring effective stakeholder involvement in the development of the project.
- Increasing public knowledge and understanding of the project implementation process.
- Using all strategies and techniques which provide appropriate, timely and adequate opportunities for all concerned parties to participate.
- Evaluating the effectiveness of the engagement plan in accordance with the expected outcomes.

14.1 Identifying Stakeholders

Stakeholders for the purpose of this project shall be defined as all those people and institutions that have an interest in the successful planning and execution of the project. This includes those likely to be positively and negatively affected by the project. Table 9-1 identifies the key stakeholders.

The implementation of the WRIP overall depends on the meaningful participation of all stakeholders for success. Consequently the public consultation process has commenced. Meetings have been organised between the decision makers and the other stakeholders in each of the districts that contained the reservoir sites.

Invitees included farmers, Drainage Board staff, commune heads and representatives of the communes, experts on reservoir operation, and agricultural experts. A social and environmental expert from the Consultant also attended the meetings. Questionnaires were prepared and completed. Full details of the meetings and the questionnaires circulated are shown in Annex C

14.2 Consultation Strategy

- The consultation process shall ensure that all those identified as stakeholders are spoken and conferred with. The relevant section/department within the MARD should share information about the project with the public, to enable meaningful contribution and thus enhance the success of the WRIP.

Public consultation should take place through workshops, seminars, meetings, radio programs, request for written proposals/comments, questionnaire administration, public reading and explanation of project ideas and requirements.

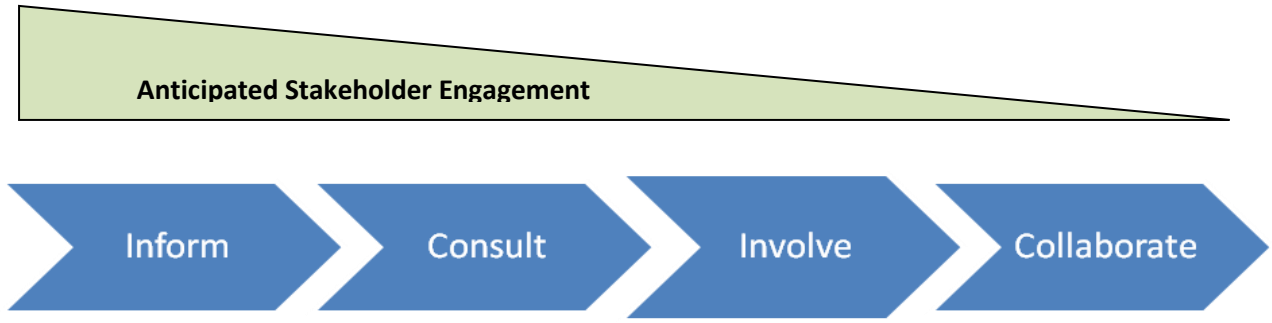
- The consultation plan would be monitored by MARD and EPAs who will set their own verifiable indicators to assess the degree of participation of the key stakeholder during all the phases of WRIP implementation.

14.3 Level of Engagement

The level of stakeholder involvement will be based on the project phase, location and expected outcome. The extent of stakeholder involvement would be based on the following;

- The project is likely to have significant impacts, that is, high impacts in one area/location, or relatively small impacts spread out over a large area. The WRIP falls into the latter category.
- The project involves significant issues, implying that a wider stakeholder audience may be affected. This is not considered to be relevant for WRIP.

This is illustrated in Figure 14-1 below.



Objective Provide public with objective information to assist them in understanding the issue.	**Objective** Obtain public feedback on analysis, alternative or decision	**Objective** Work with the public to ensure concerns are understood and considered.	**Objective** Partner with the public in Identification of preferred solution.
Tools Meetings Public Notice Exhibition	**Tools** Questionnaires Surveys Focus Group	**Tools** Networking Questionnaires Notice Exhibition	**Tools** Meetings Public Notice Exhibition

Figure 14-1: Spectrum of Engagement

Through these engagement strategies; the MARD would be able to:

- Clarify the project's objectives in terms of stakeholders' needs and concerns
- Identify feasible alternative (in particular alternative locations) and examine their relative merits in terms of environmental, social and economic factors
- Identify and prioritise environmental issues, and establish the scope of future studies, and
- Identify processes for continued stakeholders' involvement.

14.4 Points Raised from Public Consultation meetings

In general the meetings were conducted in a cordial manner and were very informative. Issues that arose were on matters regarding the water quality of the water, this particularly concerned Murriz Thana reservoir.

At least two other reservoirs are used or intended for use as small scale hydropower production. Belesova reservoir has a small hydropower facility and one is intended for Murriz Thana.

Other points that were raised were on the siltation, as many of the sites were prone to high rates of sedimentation which is seriously reducing the reservoir capacity.

In most of the sites drinking water is obtained from wells or other natural water sources, and it is of satisfactory quality. Sewage is discharged into tanks (not septic) but small amounts are flushed into the reservoirs (e.g. Belesova reservoir) during heavy rainfall. New buildings (house and restaurants) are being built close to the reservoirs and there is some concern on pollution to the irrigation water.

However, in general all the participants were positive and interested at the immediate project implementation despite the above environmental concerns and fully agreed with the proposed mitigation and monitoring processes.

14.5 Resettlement Policy Framework

The Terms of Reference for the ESIA requested the resettlement policy framework (RPF) to be prepared as a separate document. The contents of the RFP can be shown as follows:'

1 INTRODUCTION
1.1 Project Background
1.2 Project Components
1.3 The Project Area
1.4 Objectives and Principles of Resettlement Policy Framework
1.5 Objectives and Process for Resettlement Action Plans
1.6 Layout of the Resettlement Policy Framework
2 INSTITUTIONAL AND LEGAL FRAMEWORK
2.1 Institutional Framework
2.2 Legal Framework
3 ELIGIBILITY AND ENTITLEMENTS
3.1 Eligibility
3.2 Entitlements
3.3 Valuing Affected Assets
4 RAP INFORMATION REQUIREMENTS
4.1 Census and Inventory of Project Affected Persons
4.2 Identification of Losses
4.3 Baseline Survey
5 COMMUNITY PARTICIPATION/GRIEVANCE PROCEDURES
5.1 Consultation with Affected Populations
5.2 Monitoring Income Restoration
5.3 Mechanisms for consultations
5.4 Description of the implementation process
5.5 Arrangements for funding resettlement
5.6 Responsible Institutions and/or Agencies
5.7 Grievance Redress Mechanisms
6 COSTS AND BUDGETS
7 ANNEXES
7.1 Annex 1: Proposed Formats for RAP and Abbreviated RAP
7.2 Annex 2: Provisional Entitlement and Compensation Matrix
7.3 Annex 3: Checklist and Data Requirements for Census
7.4 Annex 4: List of Data for Inventory of Losses
7.5 Annex 5: Data for Baseline Survey

The RPF has been prepared and is available as a separate document.

15 ANNEXES

15.1 Annex A1 – Questionnaire for EU Candidature – Point 54 For PPP

ANNEX A1
QUESTIONNAIRE FOR EU CANDIDATURE

Point 54. Plant health; Plant Protection Products (PPP):

- **Launching in the market of Plant Protection Products;**
- **Defining and inspecting maximal levels of remnants**

A. Competent and responsible authorities.

MARD , through:

- Directorate of Animal Health and Plant Protection (DAHPP), in the area of for plants protection products, is the competent authority in the Republic of Albania regarding issues of developing policies, inspection activities, respective administrative procedures of registration and monitoring, as well as in the international cooperation;
- Directorate of Food Safety and Consumer's Protection (DFSCP) is the central competent authority for remnants of products for the protection of plants and products of vegetative origin.

MARD, together with the Ministry of Tourism and Environmentand the Ministry of Health is responsible for drafting regulations on the registration of products for the protection of plants (PPP).

The institutions responsible for assessing the files during the registration procedures regarding toxicological and eco- toxicological data, as well as for carrying out physical- chemical assessments and biological analyses of products for the production of plants are: Institute for Public Health; Ministry of Tourism and Environment, Institute for Food Safety and Veterinary (FSVI); Department of Plant Protection, from University of Agriculture, Tirana.

Registration procedures of PPP are as follows:

- PPP Registration Office (in the Plant Protection Division at the DAHPP) handles the registration file, which contains technical documentation and complementary documentation (request for registration, original or notarized certificate of registration in one or two EU countries including the respective label) and after treating it, approves the beginning of registration procedures. If the Registration Office does not approve the file within 30 days, it sends a written notification to the applicant describing the reasons of not approving or requests additional data. In addition, the applicant sends for treatment (analyses) the following: the PPP sample, sample packaging, analytical standard of the PPP ingredients for further analyses in the laboratory of PPP at the FSVI.
- PPP documentation is submitted at the assessment institutes within 20 days from the date of approval.
- Assessment institutes make the assessment of the documentation data of PPP within a period of six months, by preparing for each PPP the respective monograph, which is sent to DAHPP.
- PPP Registration Office, based on the monograph for each PPP, prepares the briefing material for the next meeting of the State Committee for the Registration of PPP.
- PPP Registration Office, based on the briefing material and the outcomes of the State Committee for the Registration of PPP, prepares the registration document for each approved PPP, as well as notifies the applicant ofthe registration or not of the PPP.
- The registration document of the PPP is issued by the Executive of the DAHPP and contains the registration certificate and the PPP label.

MAFCP is responsible for PPP regarding regulations as well as carrying out the inspection procedures. In addition, it is responsible for the start and follow-up of PPP registration procedures.

The procedure of issuing the registration document (the Certificate and the Label) for marketing and using PPP is the final administrative stage of registration and is followed by the final list of the registered PPP. This list is compiled whenever changes are made in it, and is published in the Official Website of the MAFCP.

Institute for Food Safety and Veterinary (FSVI) at MAFCP:
PPP laboratories are included in the Plant Protection Division, which is under the authority of (FSVI) and cooperates with the Animal Health and Plant Protection Directorate at the MAFCP. This division's main activity is: the assessment of PPP under registration process (treatment of files, physical-chemical verification of ingredients of the PPP; physical-chemical verification of PPP which are found in the Albanian market. This is made in the framework of continuous monitoring in order to keep under control possible misuse that might occur in the market.
This division started functioning in 2009. The reconstruction of this division and its supply with contemporary equipments, which started in 2008, was enabled by the state budget with a total investment of 59,000,000 (fifty nine million) leke. The equipments of the laboratory are contemporary and sufficient for carrying out the above-mentioned analyses.
The main analytical methods used for physical-chemical analyses for PPP forms are: CIPAC, and analytical methods for pesticides, which are attached to the registration file. These laboratories are highly accurate thanks to the infrastructure and contemporary instruments that this structure holds.
In the near future the division of PPP remnants in vegetative products is planned to be created in this institute. Of course, this requires investment for building the necessary infrastructure, its supply with equipments from contemporary methodologies and additional staff in the structure of this institute. Analytical methods for the analyses of PPP remnants include analytical methods for pesticides, which are attached to the registration file (for the moment the remnants analyses has not started yet).

State Committee for the Registration of PPP:
State Committee for the Registration of PPP, set up in the DFSCP, at the Ministry of Agriculture is composed of seven members:

a. One representative from the Plant Protection Service at the Ministry of Agriculture;
b. One representative (hygienist), from the Ministry of Health;
c. One representative (environmental expert), from the Ministry of Tourism and Environment;
d. One representative (work safety expert), covering the field of safety at work;
e. One representative chemist analyst from the Institute for Public Health;
f. One expert from the Institute for Food Safety and Veterinary;
g. One professor from the Department of Plant Protection, from University of Agriculture.

The list of the committee members is approved by order of the Minister of Agriculture, after the proposal made by the respective institutions.

Committee members must not have conflict of interest in the field of PPP. They have to declare in advance their relations, if any, with PPP import or marketing subjects.
The committee serves as a counselling body the functioning of which is regulated by order of the Minister of Agriculture.

Phitosanitary Inspectorate at the Regional Directorate of Agriculture, Food and Consumer's Protection in regions:
The activities of PPP inspection, which are carried out by Phitosanitary Inspectorate at the Regional Directorate of Agriculture, Food and Consumer's Protection from the import to their use, include: administrative activities of inspecting and those related to legal issues; inspections of PPP remnants in plants and products of vegetative origin in the Albanian market (this activity has not started yet because there is no

laboratory of PPP remnants); inspecting the import and transit of PPP (is carried out by the Phitosanitary Inspectorate in the border crossing points, in addition to quarantine inspection of plants, vegetative products, and other objects); approval for the functioning of the wholesale warehouses and PPP retail units; verification of fulfilling the technical criteria for equipment with selling permit for persons or interested subjects; quality inspection of PPP after registration by taking samples for analyses and sending them to the FSVI; the implementation of law regarding labelling and packaging of PPP.

At local level phitosanitary inspection is carried out by Phitosanitary Inspectorate, which operates in the offices of the state administrations in 12 regions.
Phitosanitary Inspectorate in border crossing points is part of the structure of Phitosanitary Inspectorate at the Regional Directorate of Agriculture.
Until now, this inspection has been focused mainly on implementing the law from the import to PPP use.

With the set up and functioning of the PPP laboratory, the inspection has started by taking samples for analyses of PPP after registration. Samples have been sent to laboratory at the FSVI for physical and chemical analyses of PPP, to verify if their physical and chemical data are identical with those declared in the registration file of the PPP submitted by the producers (applicants). This activity has just started partly with analyses of imported PPP (10-12 samples sent for analyses within a period of 3-4 months), for the laboratory of analyses has started to function in this period. The present legislation of the protection of plants which is related to PPP has provided in a general manner the methods of carrying out certain procedures. For example, procedures of inspection, methods of taking samples for analyses, etc.

Ministry of Health (MoH)
MoH is responsible for PPP regarding setting the regulations of registration and assessment criteria as well as for carrying out assessments of documentation regarding toxicological data and classification of PPP in toxicity category. This institution makes the assessment of qualification of PPP in a toxicity category.

In addition, the approval for the functioning of wholesale warehouses of PPP is made by the State Sanitary Inspectorate.
Activities related to the toxicological studies have been delegated from the Ministry to the Institute for Public Health.

The Laboratory of Instrumental Chemistry, as a unit of the Department of Health and Environment, carries out in practice all the activities which are related to water, air, soil and food toxicological analyses. This laboratory carries out even the assessment of PPP toxicology documentation during the registration and issues an assessment toxicological report (monograph). Actually, it does not carry out the examination of toxicological samples. The unit has a total of seven employees at disposal for work, from which four are senior chemists and three laboratory technicians. These employees also carry out other tasks included in the institute's scope of work. One expert is responsible of issuing reports of toxicological assessment in addition to other tasks. The number of experts is adequate for the present workload.

Working premises are insufficient while laboratory equipments are contemporary.

Ministry of Tourism and Environment:
MEFWA is responsible for PPP in setting registration regulations and assessment criteria as well as in carrying out assessments of documentation regarding eco- toxicological data and the classification of PPP related to their impact on the environment.

The conditions of environmental permit for eliminating PPP by incineration, as well as those of the functioning of the PPP wholesale warehouses are set by this ministry, through Directorate of Assessment of

Environmental Impact and Permits and verifies them through the Environment Inspectorate. The present staff, in addition to other tasks provided by the environmental law, covers even the two above-mentioned activities.

The evaluation of PPP registration documentation is carried out by the Judicial Directorate of Pollution Prevention at the MEFWA.

There is lack of adequate staff for carrying out this activity. In the framework of the reconstruction of the ministry, there will be an expert handling chemicals, including PPP.

Department of Plant Protection, at the University of Agriculture, Tirana:
This department is a basic unit at the Faculty of Agriculture and Environment, of the University of Agriculture, Tirana, which is under the authority of the Ministry of Education and Science.
Part of the internal organisation of this department is the Laboratory of Plant Protection, which, in accordance with the provisions of the effective Law on Plant Protection, has been authorised to carry out professional and technical activity related to products for the protection of plants, for assessing PPP files, as well as to carry out agronomic and biological analyses of PPP, when such a thing is requested by the DAHPP.

In addition, for carrying out various analyses and experiments for the protection of plants, this laboratory owns six hectares of land, including: one hectare of fruit trees, 0,4 hectares of vineyard, 600 square meters of screen house covered by net, 300 square meters of screen house covered by glass, 2,8 hectares of field and another area of land.

Ministry of the Interior (MoI)
This ministry is responsible for PPP regarding:
- the functioning of PPP wholesale warehouses, and gives its approval through the state police,
- regulations and measures for protection from fire.

Ideas about the future
Even in the future, the structure and functions of competent bodies, those responsible as well as technical and scientific institutions, for the PPP registration activity will remain the same. There is expected only one change that has to do with transferring the laboratories of the Department of Plant Protection to the Institute for Food Safety and Veterinary. Thus, the Ministry of Education and Science is left out of the present scheme.
As far as monitoring the process from marketing to using PPP and their remnants is concerned, this activity will continued to be carried out within the MAFCP, but under the authority of NFA, which will include even Phitosanitary Inspectorate.

While the inspection of PPP remnants in products of vegetative origin, which are used as food for people and animals, in the Albanian market will be carried out by the food inspectorate of NFA in regions (this activity has not started yet, for there is no laboratory of PPP remnants).

While the unit of plant protection at the MAFCP will be directly responsible for developing the respective legislation as well as for consolidating issues related to PPP and their remnants, for example, compiling and extending respective regulations and coordination with existing professional institutions, most of which will continue to be involved in these activities, as well as in international cooperation. This unit will be responsible even for the registration of PPP.

Proceedings on the MAFCP legislation on the PPP remnants have just started, while analyses of their remnants have not started yet due to lack of laboratory infrastructure. In the future, MAFCP will continue

to be the competent authority for legislative issues regarding PPP and their remnants, in alignment with the respective directives and decisions of the EU.

As a major objective, the legal package for PPP remnants will be developed, while the implementation of this legislation is expected to start with the setting up of the remnants laboratory at the FSVI.

B. Adaptation and implementation of the legislation
- Law 9362/24.03.2005 on "Plant Protection Service" amended; Official Gazette 29/3.5.2005.
- Decision of the Council of Ministers 1188/20.8.2008 on "Approving regulations for importing, marketing, transporting, storing, using and eliminating PPP", Official Gazette 141/11.9.2008.
- Decision of the Council of Ministers 1555/12.11.2008 on "Approval of regulations of the PPP registration and assessment criteria", Official Gazette183/22.12.2008.

Plant Protection Law contains a certain number of basic provisions for PPP, based on the EU directives regarding:

- registration, where it specifies that all PPP that enter and/or are used in the territory of the Republic of Albania be subject to registration procedures, allowing only the registration of PPP which have been registered in the countries of the EU;
- appointing PPP assessment institutions during the procedure of their registration;
- importing and marketing of PPP;
- transporting, storing and using PPP;
- classifying PPP in three groups: very risky, risky, other;
- classifying persons that deal with marketing and using PPP.

Decision of Council of Ministers on "Approval of regulations of the PPP registration and assessment criteria", Official Gazette183/22.12.2008, has adapted Directive 91/414/EEC of 15 July 1991 in relation to specifying plant protection products in the market, including its amendments related to: the content of the registration documentation with detailed requests and complete data (on its annexes); registration regulations and requests that PPP need to fulfil in order to be registered; the conditions in which registration, modification, cancelling, dismissal, re-registtration , enlargement of the scope of PPP use are carried out; criteria of authorisation and usage for experimental purposes; information on potential dangerous effects on the human and animal health, underground waters and the environment; storing data and confidentiality.

The most detailed explanation on the registration is provided in section A 1.
As far as classification, labelling and packaging of PPP is concerned, there has been given detailed information about: content of the label, which necessarily must be in Albanian, its designing and sticking on the package; requirements which must be met by the subjects dealing with PPP packaging; legal obligations they must abide by while conducting their activity as well as the activity of PPP trading subjects requiring to make the packing in the Republic of Albania, etc.

Decision of Council of Ministers on " Approving regulations for importing, marketing, transporting, storing, using and eliminating PPP", Official Gazette 141/11.9.2008 has adapted Directive 91/414/EEC of 15 July 1991 regarding appointing products for the protection of plants in the market, as well as treats PPP in an elaborated manner in relation to: regulation and trade inspection; issuing of the recipe in use; storing conditions in warehouses, retail units and latest users; usage and the responsibility of users (the right to use PPP according to their classification, requests of issuing Capability Certificate, professional users, preliminary measures taken in the places where they are treated, criteria for using herbicides, as well as areas where their use is banned, banning the use of PPP in certain areas, preparing the spray solution, protecting useful insects, especially the bee and pollen, restrictive measures on planting and densification

material, treating spray solutions, left over after work, as well as packaging of used PPP.); banning the use of planes in treatments; transport requests; regulations in eliminating PPP, including the manner of elimination, appointing the places of elimination, etc; monitoring their packaging and recycling; making quality analyses (during registration and when they are launched in the market).

Basic requests from Directive 91/414/EEC have been transposed in the above-mentioned Albanian legislation, but they do not comply completely with the respective provisions of this Directive.

But, Directive 91/414/EEC shall be in a transitory stage until mid-2010, as it shall be replaced with the Regulation of the European Parliament and Council, regarding the appointment of plant protection products in the market. The adaptation of this Regulation will be also the main focus of work related to the EU legislation in the field of PPP. The aim is that partial transfusion be achieved by the end of 2010, while the drafting of articles which derive from it be completed within 2012.

15.2 Annex A2 – List of Pesticides permitted- not permitted for import into Albania

List 1 – Permitted pesticides for use in Albania (256)

List 2 – Pesticides not permitted to be imported within Albania (113)

15.3 Annex B - Environmental Screening Procedures

Activities carried out under the WRIP will need to conform to current Albanian Environmental Regulations and procedures of the World Bank's Safeguards Policies.

The Albanian Law on Environmental Protection requires that any project or activity that will affect, or is likely to affect the environment, has to receive an Environmental Declaration, Environmental Permit, Consent or Authorization by the ME before implementation may commence. A Decision by the Council of Ministers has defined the projects included in this process. Without a positive Environmental Declaration the Council for Territorial Adjustment (KRT) for the locality will not grant a construction permit and construction may not legally commence[22] and without an Environmental Permit an activity with an environmental impact may not commence and continue.

The Environmental Declaration is the official document issued by ME after the review of the request and relevant documentation for the approval of the environmental elements of a project, plan or program that requires construction works, installations or schemes. If project implementation is performed in compliance with the Environmental Declaration, the competent authority issues the relevant Environmental Permit, in compliance with the requirements of Law on Environmental Protection. An Environmental Permit is the official document issued by the MEFWA, after the review and consultation of the request and its relevant documentation, with all the concerned stakeholders. It approves the exercise of any activity having an impact on the environment.

Each form of approval may include mandatory conditions and procedures to be implemented, so that pollution and damage to the environment do not exceed the allowed norms. The ME has authorized its local offices (REAs) to issue Environmental Permits for activities with a lesser impact on the environment, entitled Environmental Authorization (greater impact) and Environmental Consent (lesser impact).

The Law on Environmental Impact Assessment (EIA) defines the type and scale of the projects or activities that require an EIA before implementation. The categories of EIA are:

- A Summary (outlined) EIA. This is for projects that may have less significant potential impacts that still require an expert assessment of their impacts. They include projects listed in Appendix 2 of the Law on EIA, and any changes or rehabilitations of projects listed in Appendix 1 of the same law.
- A Profound (advanced) EIA. This is for projects with significant potential impacts, as listed in Appendix I of the Law, those projects listed in Appendix 2 of the same law which the MEFWA considers will have a significant impact on the environment (based on information provided by the proposer at the time of application, in the manner detailed in Appendix 3 of the Law), and activities that are to be implemented in a protected area or in the marine environment of the Republic of Albania

According to the Albanian law on EIA, the Summary EIA shall contain the following information (Article 8):

a) Objective of the project;
b) Detailed objective description;
c) Data on present environment of the area and in its vicinity where the project is implemented;

[22] An environmental approval from the REA/MEFWA is one of several documents that have to be submitted to the local KRT before a Construction Permit can be awarded. Another document required is an operating permit from the relevant authority, e.g. from a Water Basin Authority for a water supply or wastewater service.

d) Detailed description of all installations that are part of the project or will be used during its implementation;
e) Construction plan and the deadlines of its implementation;
f) Description of engineered values that are constructed or enlarged and of necessary works for project implementation;
g) Potential impacts on environment and proposed measures to prevent or bumper these impacts;
h) Monitoring program of project impact on environment;
i) Conformity of the project with territory adjustment plan and with economic development plan of area where project will be implemented;
j) Summary of consultations with local government bodies, the public and environmental not-for-profit organizations and of their opinions;
k) Rehabilitative measures in case of pollution and damage of environment as well as their cost;
l) A copy of the license of the legal person or organization that has prepared the EIA report.

It is to be supported by information on the project characteristics, the project location (environmental, human and cultural data) and the potential project impacts, which will be used by the MEFWA will determine the need for a Profound EIA. The information required is defined in Appendix 3 of the EIA Law. In addition to the information required in the Summary EIA the following information shall be included in the Profound EIA (Article 9):

a) Procedures and reasons of selection of site where project will be implemented, description of at least two additional options of location of project;
b) Its direct and indirect level of impact on environment;
c) Potential impacts of [project] options on environment and health;
d) Risks of accidents with significant impact on health and environment and measures to prevent these;
e) Trans-border impact on environment if any;
f) Technical measures plans to prevent and bumper negative impacts on environment;
g) Detailed descriptions about sustainable use of energy, of natural and mining resources;
h) Potential negotiations plan with local government organs, the public and environmental non-for profit organizations during the phases of planning, review and implementation of the project.

The project proposer is responsible for submitting the application for environmental approval to the MEFWA. Any EIA report required shall be prepared by an expert certified by the MEFWA for preparing such reports and for environmental auditing. Currently the MEFWA has licensed approximately 100 such experts.

Requirements for the implementation of a trans-boundary EIA and other environmental matters are also included, since Albania has ratified several international environmental conventions including: the Espoo Convention on Transboundary Impacts; the Barcelona Convention on the protection of marine environment and coastal areas of the Mediterranean, the Aarhus Convention, and the Basel Convention.

All applications for environmental approvals are submitted to the REA of the region in which the project will be implemented or the activity will be executed. The REA has certain powers to approve the implementation and operation of small projects with no significant environmental impacts. In other cases it is responsible for reviewing documentation and forwarding to the MEFWA for processing, with recommendations for approval, rejection or enhancement, as appropriate[23].

[23] According to MEFWA Guidance No. 3, dated 08/17/2004 "On Approval of the List of Business Activities, Application Forms and Rules and Procedures to Grant Environmental Consent and Authorization from the Regional Environmental Agencies (REA)"

The Regional Environmental Inspectorate is responsible for inspecting observance of the ESMP and other conditions specified in the environmental approval.

Comparison with World Bank Policies

Under the World Bank's procedures for EA, projects are categorized as listed in Table B1.

Table B1: World Bank Screening Criteria

Category	Environmental Impact	Examples
A	Project is likely to have significant impacts that may be sensitive, irreversible and diverse, or unprecedented. The impacts may affect an area broader that the sites of facilities subject to the physical works.	Construction of a new landfill. Construction of a new wastewater treatment plant. Port construction New dam construction
B	The impact on human population or environmentally important areas is less adverse than those of Category A projects. The impacts are site specific and few, if any, are irreversible.	Rehabilitation of water and sewerage networks. Rehabilitation of roads. Rehabilitation of buildings. Rehabilitation of existing dam and I&D scheme
C	Minimal or no adverse environmental impact	Technical Assistance project

The Albania EIA procedures are generally in line with the World Bank's EA process, as all projects require environmental screening and possibly assessment in order to receive an Environmental Declaration (for construction), and/or an Environmental Permit (for an activity having an impact on the environment, including some construction activities). Furthermore the type and scale of the impacts the project will have on the environment determine the procedures that have to be followed and the type of approval granted. Also all the approvals include conditions that shall be observed by the proposer including environmental monitoring and mitigation requirements.

The difference lies in the scope of the EIA required for those projects that fall into World Bank Category A and the Albanian Law on EIA (Appendix II). Some projects (e.g., wastewater management) are considered as Category A under the World Bank screening, while the same activities/projects under the Albanian Law will require only a Summary EIA for populations less than 150,000, unless the REA decides that the project must undergo a thorough or complete EIA.

To streamline the EA screening process for the Project, the approach shown in Table B2 will be adopted for all projects. It should be particularly noted that projects that are only required to undergo a Summary EIA under Albanian law, which are considered as Category A by the World Bank, will be subject to a Profound EIA to satisfy WB requirements.

The Technical design of a sub-project will integrate the findings and comments originating from the EIA and include recommendations made for the design and the mitigation of the impacts expected, as well as the conditions of any environmental approval granted.

Table B2: Screening Criteria for World Bank and Albanian EA procedures

World Bank Category	Category As Per Albanian Legislation	Procedure To Be Followed (Meeting both Albanian and World Bank standards)
A	Appendix 1, Law on EIA Example sub-projects: • landfill to receive hazardous waste; • landfill to receive at least 30t of non-hazardous waste per day	• A Profound EIA and ESMP for the sub-project will be prepared by the proposer. • At least two public consultations[24] will be held, one at the start of the EIA process and one at the end. • MEFWA approval will be obtained and the relevant environmental approval issued[25] • World Bank will review and provide no-objection to the consultation results, EIA and ESMP.
	Appendix 2, Law on EIA Example sub-projects: • wastewater treatment plant, • landfills not included in Appendix 1	• An EIA to WB requirements (enhanced Summary EIA) and ESMP for the sub-project will be prepared by the proposer. • At least two public consultations will be held (as above). • MEFWA approval will be obtained and the relevant environmental approval issued (as above). • World Bank will review and provide no-objection to the consultation results and ESMP.
B[26]	Annex 1 and 2, MEFWA Guidance No. 3, dated 08/17/2004[27] Example sub-projects: • Rehabilitation of existing infrastructure (including dam and I&D schemes)	• An ESMP will be prepared by the proposer (to meet both Albanian and World Bank requirements). • One public consultation will be held. • MEFWA approval of ESMP will be obtained, and the relevant environmental approval issued (as above). • The World Bank will review and provide no-objection to the consultation result and ESMP.
C	Not included in either Appendix 1 or Appendix 2 of EIA law, Can be in Annex 1 and 2, MEFWA Guidance No. 3	• EMP only prepared as required by environmental conditions and MEFWA requirements. • MEFWA approval of ESMP will be obtained, and the relevant environmental approval issued (as above).
N/A	Strategic Environmental Assessment (SEA) (e.g. development programs on transport, energy, tourism, industry, services, land use, etc.)	• Special legal dispositions regulate the procedures. • A positive environmental declaration is required for adoption of sector strategies, development action plans, and programs.

<u>World Bank Screening Criteria as written under OP 4.01</u>

Environmental Screening

The Bank undertakes environmental screening of each proposed project to determine the appropriate extent and type of environmental assessment. The Bank classifies the proposed project into one of four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts.

Category A: A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader

[24] Public Participation Regulations No.1 "On Public Participation in the EIA Process", MEFWA, 17/08/2004

[25] Environmental Declaration for construction, etc, Environmental Permit, Authorization or Consent for the exercise of any activity having an impact on the environment (including some forms of construction)

[26] In case a Category B sub-project is listed in the EIA Law Appendix 2, the EIA will be prepared in parallel with the EMP to MEFWA requirements

[27] On Approval of the List of Business Activities, Application Forms and Rules and Procedures to Grant Environmental Consent and Authorization from the Regional Environmental Agencies (REA)

than the sites or facilities subject to physical works. Environmental assessment for a Category A project examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. For a Category A project, the borrower is responsible for preparing a report, normally an EIA (or a suitably comprehensive regional or sectoral environmental assessment) that includes, as necessary, elements of the other instruments referred to in para. 7.
Category B: A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas--including wetlands, forests, grasslands, and other natural habitats--are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigatory measures can be designed more readily than for Category A projects. The scope of environmental assessment for a Category B project may vary from project to project, but it is narrower than that of Category A environmental assessment. Like Category A environmental assessment, it examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. The findings and results of Category B environmental assessment are described in the project documentation (Project Appraisal Document and Project Information Document).

Category C: A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further environmental assessment action is required for a Category C project.
Category FI: A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in subprojects that may result in adverse environmental impacts.

15.4 Annex C - Details of Public Consultation and Questionnaires

The public consultation with decision makers and meetings were organized in each of the district areas. The invitees included farmers, Drainage Boards staff, commune authorities and representatives of communes, experts on reservoir operation, agricultural experts, etc. In addition at least one representative of environmental experts group and social experts group of the consultant has participated in such meetings.

For this project the consultant prepares three types of questionnaires (the questionnaires templates are attached at the end of this annex). The first questionnaire was one that was filled by consultant in respect with environmental and social status at the meeting, the second questionnaire for decision makers (who were represented at meetings), and the third one, for community representatives, stakeholders, interested parties etc, that will be represented at future project steps and consultations.

Other people that attended included regional environmental experts, water engineers, commune representatives etc. The consultant group briefly presented the project aim and objectives. The meeting participants informed the consultant what the local decision makers were expecting from the project development and the consultant got answers for many questions regarding social and environmental issues.

The meeting provided satisfactory conversations, and the decision makers and technicians were totally agreed with the preliminary environmental and social management plans. Between others were discussed the environmental problems of waters, mostly regarding the Murriz Thana reservoir, the ownerships in surroundings infrastructure etc. Some of the reservoirs (Belesova) are used by private companies for energy production (mini hydropower) and some others are in the tendering process (Murriz Thana reservoir), to be used for hydropower production.

All reservoirs are prone to high sedimentation and their capacity is reduced seriously. In most of the sites the drinking water is taken from the wells or other natural water sources, and is of satisfactory quality. Sewage is discharged into tanks (not septic tanks) and small amounts (e.g. at Belesova reservoir), are flushed and discharged into the reservoir body by rainfall events. In the vicinity of some of them are built new houses, or restaurants. In all meetings the participants were more interested at immediate project implementation than on environmental concerns, but they still fully agreed with mitigation and monitoring processes of environmental elements.

Summarized minutes of meetings with Berat Decision makers

The meeting with Berat Decision makers was organized in 17/05/2012, in the office of General director of Irrigation Board of Berat Region. The following are given only the questions raised from decision makers or technical personnel or their suggestions regarding excepted issues by project development. The list of participants is attached in the end of the report.

Name and profession	Summarized questions or suggestions	Answers	Level of acceptance
Artur Cepani Director of irrigation and draining board	Is it possible for the remediation of the sites damaged during construction activity to be included in ESMP?	Yes it is part of the Specific ESMP	Very good
Dashmir Meliku Board engineer	Can the project be implemented this year?	Not, sure for the time of project implementation	Good
Kastriot Lapaj	Will the ESMP consider the possible damages in infrastructure (roads etc)?	The specific ESMP will include at least the revitalization of all infrastructure damaged by the project development	Very good
Ferit Kajo Belesova reservoir technician	Is it possible to dredge the reservoirs at the same levels like were planned?	The technical engineering team will decide what will be the revitalization steps of the reservoirs. Until now, most of the works are focused on dam rehabilitation and restoration/opening of the spillways etc	Good
Spartak sinojmeri Environmental consultant	May the board and commune representatives, join the consulting team during field visits to each reservoir and meetings with interested community and decision makers?	Yes, everyone will support the consulting team visits to the field trip investigation and public consultation with community	Very good
Bledi Memo Socioeconomic consultant	Are there any planned constructions near the dam or close to it that can affect the project implementation?	In general not, but it can be decided only with appropriate plans prepared by engineering team for dam and spillway rehabilitation	Very good

Between other communications the Consultant was informed that Slanica, Duhanas and Belesova reservoirs are not used for fishing. But Belesova is used for energy production. Close to the Slanica reservoir are built some houses. The community and commune stakeholders and decision makers agreed to fully operate with the environmental/social consultant. At the end the consultant deliver the questionnaire, and date to get it already filled on two weeks. The technician suggested to the Consultant to point out in their report, that all Berat reservoirs are under their capacity, not only by dam damage, but also by high sediment disposals in reservoir bodies.

Meeting with Decision Makers of Fier Region

The meeting was organized in 16.05.2012 and the participation was a t a satisfactory level. The Consultant presented the project goal and objectives and than required the support of decision makers for offering the technical data and facilitate field investigation and public consultation. In the Kurjan, Strum reservoirs the drinking water is mainly ensured by existing net. Energy supply and water quality has problems during the winter time. Except for some constructions close to the reservoirs built last times that are freely discharging their sewage into the reservoir, the others are using tanks. A restaurant is built close to the reservoir, but for the moment it is not operating. The reservoir is used for fishing by private entities, that are owned from the site inhabitants. The fishermen are using the fish for food and trade. The Zharrez reservoir is not used for fishing. No one discussed issues regarding the quality of Zharrez reservoir (i.e. pollution from oils).

Name and profession	Summarized questions or suggestions	Answers	Level of acceptance
Qazim Shutka Surveyor	Is the consultant considering that the reservoirs capacity is reduced, and reservoir operational time is increased?	Not exactly. The engineering team will clarify any detail on reservoir operations and their revitalization.	Satisfied
Qazim Shultka Surveyor	The dredging of the reservoir looks impossible. Is increasing the dam height being considered as an option?	Increasing of the dam altitude, is not yet proposed by technical teams, but may cause problems on flooding of lands and other assets in surrounding. In any case, for each of the steps of reservoir rehabilitation, if possible a mitigation measure will be used as a response	Satisfied
Xhevair Bregaj economist/Kurjan	Is the project considering the remediation of infrastructure?	It can be proposed only in case that the infrastructure will be affected by project development	Satisfied
Rrapi Tabaku drainage board	Will consultant consider the enlargement of spillway or their paving?	Yes, this is one of the most important impacts to be suggested by engineering team and considered in detail in specific ESMP	Very good
Spartak sinojmeri Environmental consultant	May the board and commune representatives, join the consulting team during field visits to each reservoir and meetings with interested community and decision makers?	Yes, everyone will support the consulting team visits to the field trip investigation and public consultation with community	Very good
Bledi Memo Socioeconomic consultant	Are there any planned constructions near the dam or close to it that can affect the project implementation? Do you think the enlargement of spillway, upon the projects prepared before, affect any construction?	In general not, but it can be decided only with appropriate plans prepared by engineering team for dam and spillway rehabilitation Yes, they can affect several constructions in the village	Very good

In the end the consultant delivered the questionnaires to the participants, and agreed with them to deliver a copy also at other decision makers that cannot come at the meeting. Both parts agreed to get the filled questionnaire after two weeks.

The meeting with Decision Makers of Lushnje

The meeting was organized at 17.04.2012, in the office of border Director of Lushnje. The participation was very good and acceptance excellent. The talks focused around Murriz Thana reservoir. The road that goes to the dam was in better condition than the roads of other reservoirs considered in this project. In case of road enlargement the electrical cables can be affected. The reservoir is planned to be used also for energy production. The reservoir is used also for fishing purposes, that are administrated from two private entities. One of them is trying to put in operation a fish nursery, about 145m far from the dam. The sewage is discharged into tanks and drinking water is taken from wells. In the peripheral part of the reservoirs, downstream of the dam are two houses, and one people from community has fenced 18000m^2 of land in surroundings of the dam. The reservoir suffers from the higher salinity between August to the October, when the rains falls and Devolli River discharges increase.

Name and profession	Summarized questions or suggestions	Answers	Level of acceptance
Ylli Gjuzi Board Director	What is the time frame of the project and when he can be implemented?	We are not sure, but as soon as to be approved the technical design and defined the implementing agency	Good
Andrea Vogli OPU Krutje	Is the consultant considering the future operation of the reservoir as hydropower station?	It will be considered in detail in specific ESMP	Satisfied
Xhemal Haskaj OPU Cukas	Can be the water quality a reason to jeopardize the project development?	It will be decided during project steps, but it doesn't look like that	Satisfied
Ferdinand Dervishi Water engineer	Does the project consider to isolate the part where the water is polluted by salinity	It will be seen, but generally it depends on the cost	Very Good
Andon Meco Komuna Fier Shegan	Does the project consider damages in infrastructure by project implementation	Yes, this is one of the main goal of socio-economical parts of the study	Very Good
Spartak sinojmeri Environmental consultant	May the board and commune representatives, join the consulting team during field visits to each reservoir and meetings with interested community and decision makers?	Yes, everyone will support the consulting team visits to the field trip investigation and public consultation with community	Very Good
Bledi Memo Socio-economic consultant	Do you think that construction and fenced lands close to the dam will be affected by constructions and what is their legal status	It can be decided only with appropriate plans prepared by engineering team for dam and spillway rehabilitation. They were not sure about the legal status of the constructions and lands	Very Good

The meeting has really usefull outputs and the outcomes were excellent. In the end of the meeting the consultant delivered the Decision makers questionnaires, and agreed with decision makers to get it back already filled on two weeks.

The meeting with Decision Makers of Korça

The meeting with Decision makers in Korça was organized in 22/05/2012, at Irrigation and Drainage Board offices. The participation was very good, and representatives of communes, drainage boards, farmers, etc. were present in the meeting. The goal of the meeting was:

- Informing the decision makers on expected output of the projects, the importance of environmental and social impacts, community information etc. Inviting of decision makers to express their demands and requests during the meeting.
- Collection of information on agriculture status in the region, the status of both reservoirs and their dams, on the irrigation system that are using the waters of such reservoirs etc.
- Underlining of the importance of social impacts and needs for compensation for possible negative effects during construction and/or operation phase.
- Asking their opinion on possible institutional strengthening to be provided to irrigation system.

Name and profession	Summarized questions or suggestions	Answers	Level of acceptance
Jetnor, Director of Drainage Board	What are the details of project development and what is the time expected for implementation	The consultant offers existing designs and expectation on project development, and clarify that there are not exact data for its implementation, nevertheless is known that it will be done ASAP	Very good
Abdul Dyzho Drainage Board engineer	Needs and solutions for Dam and system rehabilitation	Agreed, but suggested that this part will be finalized be engineering team, and social and environmental cost are very important on detailed planning and design	Very good
Naum Mujo Prig Commune	Expectation and understanding of the community is in favourable levels	This ensure a better project implementation and community participation	Very good
Bardh Qilimi environmental consultant	Needs for support of the drainage board and community representatives on public consultation and field surveys	Fully agreed on collaboration	Very good
Bledi Memo Socio-economic consultant	Do you think that construction and fenced lands close to the dam will be affected by constructions and what is their legal status	It can be decided only with appropriate plans prepared by engineering team for dam and spillway rehabilitation. Their were not sure for the legal status of the constructions and lands	Very good

On the end, the consultant delivered the questionnaire and the parties agreed to fill it in and hand it back within two weeks. At the end the local representatives joined the consultants on a field trip in reservoirs under the study.

On 23.05.2012, was organized the meeting with Kelti Mano, director of Korça REA. The consultant informed the director about the project goal, objectives and present status, and the Mr. Mano expressed its institution interest on collaboration.

The Meeting with Decision Makers in Kukes/Tropoja

The meeting was realized at Drainage Board offices, in date 25/05/2012 and participate the drainage board authorities and engineers, the representatives of Tropoja, community representatives etc.

Name and profession	Summarized questions or suggestions	Answers	Level of acceptance
Bujar Shehu Director of Drainage Board	Comments changes on cultivation of crops during last year because of missing irrigation waters	As soon as it is possible, the situation will be ameliorated	Good
Hasan Cuka Fierze commune	Emergency needs for irrigation justify its efforts to fulfil any of project demands regarding community and Fierze commune?	Appreciation on such support and presentation of how the community can be support project development	Very Good
Qemal Memish Regional directorate of Agriculture	What is the time frame for project implementation?	The EIA should be finished in three months. Not sure for the other project, but MAFCP, WB and donators are interested that the implementation will be ASAP	Very Good
Hamit Ferizolli Fajze	Does the project need the support of Fajza commune for Tregtan and Vranisht reservoirs	Sure, in all project phases will be needed the community support. In our phase we are constructing the project transparency and then we will get useful data from the community in relation with their demands and pretends, issues etc. regarding the project implementation	Very Good
Bardh Qilimi environmental consultant	Needs for support of the drainage board and community representatives on public consultation and field surveys	Fully agreed on collaboration	Very good
Bledi Memo Socio-economic consultant	Do you think the enlargement of the road, using of the space for car movement etc, will get constrains by community, land owners or users	In this stage doesn't looks any complains or not satisfactory reaction. Everyone is interested on irrigation	Very good

In the end, the consultant delivered the questionnaires for decision makers and agreed with participants to distribute it, fill it in and give back within 2 weeks. After the meeting, the engineers and director, joined the team on field trip for a general view on reservoirs under the study.

Annex C-2– Participation meetings in Berat, Fier, Lushnje, Korca and Kukes/Tropoja

Following is the participation list in Berat meeting with decision makers

17.05.2012

1) Spartak Sinojmeri, WB CEIA [illegible]
0673044617

— Rez. Bekrovës . Ferit Lajo [illegible]
3)

4) Bledi Memo [illegible]

5) [illegible]

6) Nazmi Lufaj [illegible]

7. Besim Daada [illegible]

8) Edmond Lole Kryetar i federatës
Uznov-Vertop për mbrojtjen edhe OPGe
rezervuarët të Duhanasit
Tel. 0683520561.
Edmond Lole

9)

10) Jeftenë Toleçdan P/2-Ne. M. i Okes
Komuna Velabisht.

11) Dashmira Mekingu Përgj. e Sek. Teknik
Bordi i Kullimit Berat

12) KASTRIOT RAPAJ KRYETARI -
KOMUNËS VELABISHT

13) ARTUR QEPANI
DREJTOR BORDIT KULLIMIT

14) Zulo Gozhino 0692260611
Rgupo Bendaj perfaques
Komuna Cukalat

15)

16)

17)

18)

19)

The following is the participation list in Fier Meeting with decision makers

16.05.2012

Staravecka

Takimi në Fier

1) Spartak Sinjari CEIA

2) Bledi Memo Sp.S.E

3) Emiljano Toshkezi, P/Z/URBANISTIKES

4) Qazim Shuteka Topograf 0692134659

5- Rrapi Babaka Z.Ci. 0672656632

6- Zani Matie D. Azjent. ujit 0682440863

7 Fane Babo P/T. Buxheti Roskovec

8- Mimoza Daka Ing. Bordi kullimit Fier

9- Afërolita Shuma Personel Bordi Kullimit

10- Xhevair Brepaj ekonomist Bordi Kullimit

11- Sazej Gjergjifti Topografi

12 Elidia Bocova Spec.ujit B.kull Fier

13 Ramada Inxhinjer B.kull

Following is the participation in decision makers meeting in Lushnje

17.05.2012

Takimi në Lushnje

1) Spartak Sinojmeri CEIA
2) Ylli Gjuzi DR Bordi Lushnje
3) Andrea Vaja Kr. OPU Kuçje
4 - Najmije Vorfulli spec. sell. ujitëse
5 - Xhemal Hasko Dr. OPU Cukas
6 Gjergji Lisi Z.H.M.T. Allkaj
7 Ferdinand Dervishi Ing Hidro
8. Evarist Koliçi Ing. Hidroteknik
9 Spiro Gjeka Konstruksje
10. Vasil Nobreka Bordi Lushnje
11 Andon Meço Komuna Fier Shegan
12 Ramil Irveluli
13. Bledi Hemo

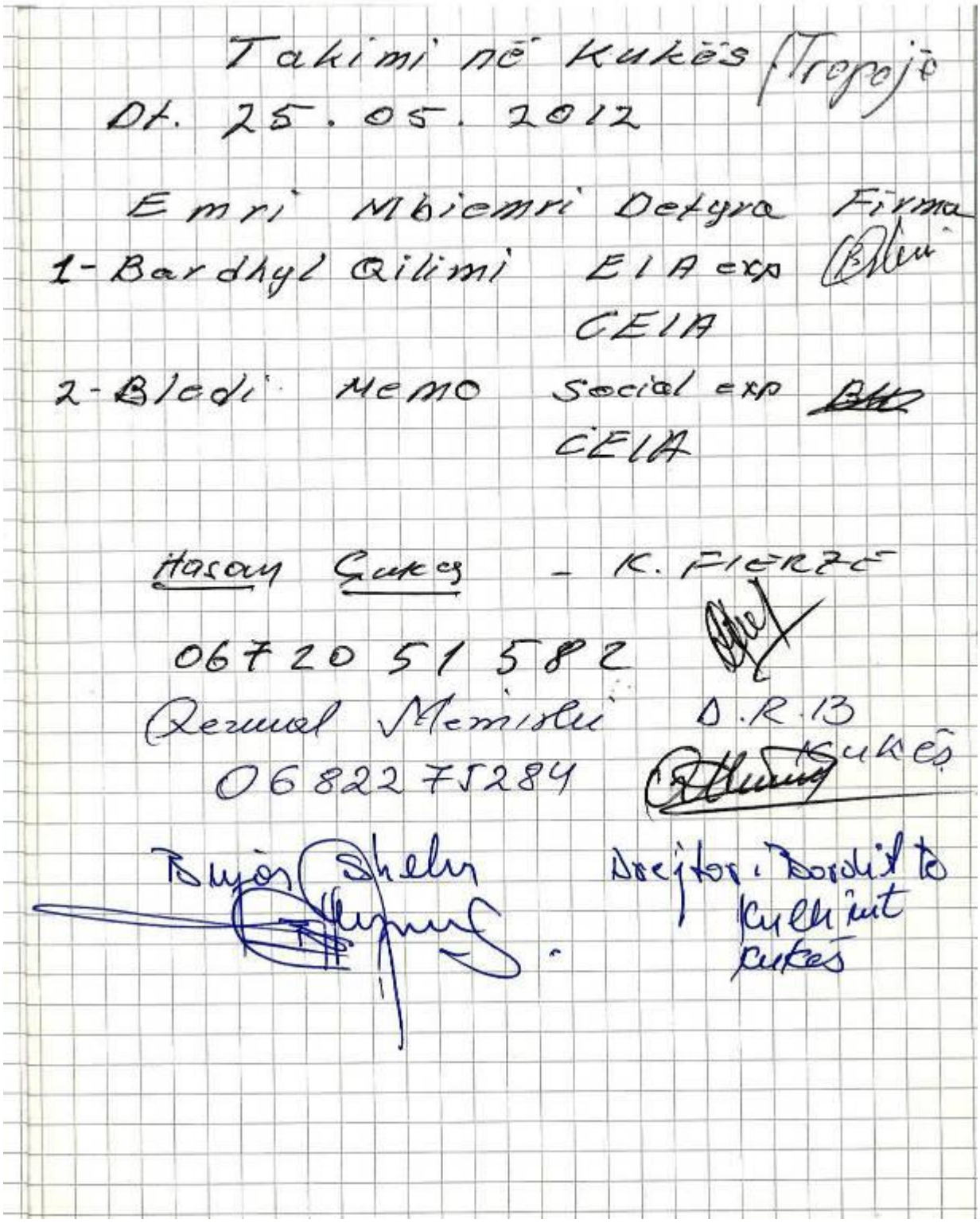
Following is the participation on Decision makers meeting at Korca

22.05.2012

Takimi në Korçë

emri Mbiemri	detyra	firma
1) Bledi Memo	Social exp CEIA	
2) Bardh Qirjini	EIA exp. CEIA	
3) Naum Mujo	0674021128	
4) Kryeartis Sejdo	0672022020	
5- DEFNOR HYSOLLI	069 60 77 046	
6- Andy Duka	përgj. Sek. teknik, B.K.Korçë 0632056063	
7. Niko Curila	0692626352	
8. Hekim Hoxha	0695399304	

Following is the participation in decision makers meeting in Kukes/Tropoja



Takimi në Kukës / Tropojë
Dt. 25.05.2012

Emri Mbiemri	Detyra	Firma
1- Bardhyl Qilimi	EIA exp CEIA	
2- Bladi Memo	Social exp CEIA	

Hasan Gukaj - K. Fierzë
06720515 82
Rexhaj Memisaj D.R.13 Kukës
06822755284
Bujar Shehu Drejtor i Drejtorisë Kullimit Kukës

Annex C3- Questionnaires

Questionnaire directed to the meeting

The main part of information is required for 13 reservoirs.

1. For what purposes is used the reservoir (irrigation, fishing etc and how many people/families or subjects get access on it)
   Per cfare qellimesh perdoret rezervuari (ujitje, peshkim etj dhe sa persona/familje apo subjekte kane akses me te)

2. What kind of activities are developed in surrounding of reservoirs and how far are they from the dam? Are they damaging the environment or infrastructure and how?
   Cfar lloje aktivitetesh zhvillohen ne rrethinat e rezervuareve dhe sa larg jane ato nga diga? A e demtojne ato mjedisin dhe infrastrukturen dhe nese po si?

3. What are the natural trees covering the surroundings of reservoir and the dam?
   Cilat jane bimet natyrore qe mbulojne rrethinat e rezervuareve dhe digen?

4. What are the main wildlife that live in the area? Are they damaging the livestock or gardens and other agricultural products?
   Cilat jane kafshet e egra qe jetojne ne zone? A e demtojne ato blegtorine apo kopeshtarine, ose produktet e tjera bujqesore?

5. What are the fish types living in the reservoir, and are they used for food or trade? How many fishermen are operating in the reservoirs?
   Cilet jane peshqit qe jetojne ne rezervuare, dhe a perdoren ata si ushqim apo per tregeti? Sa peshkatare peshkojne ne rezervuare?

6. How is the type and the quality of access between the main road and the road to the dam (road quality and specifics regarding capacities (how many ways, paved or not etc.). If not road there is any access to the dam?
   Cili eshte lloji dhe cilesia e aksesibilitetit mes rruges kryesore dhe asaj qe te con ne dige (cilesia e rruges dhe hollesi persa I perket kapacitetit (sa kalimshe, e shtruar apo jo etj.). Nese nuk ka rruge, ka ndonje akses per ne dige?

7. By what is surrounded the road (sides of the roads, ex. Gardens, houses, pipelines, electric cables, channels etc.)
   Nga cfare jane rrethuar rruget (anet e rruges, p.sh. kopshte, shtepi, linja apo tubacione, kablle elektrike, kanale etj)?

8. It exists any construction in the dam or in it surroundings that can affect or can be affect by reconstruction or operation works into the dam or affected by reconstruction works? How many constructions, their size and use. How far is it? Who own or administrate it?
   E ka ndonje ndertim ne dige apo ne rrethinat e saj qe mund te ndikoje apo te ndikohet nga rikonstruksioni I diges, aktivitetet rindertuese apo funksionimi I saj? Sa ndertime, permasat dhe perdorimi I tyre. Sa larg eshte nga diga? Kush eshte apronari apo perdoruesi I tyre?

9. Where are they taking the drinking water and is that in appropriate quality?
   Nga e marrin ujin e pishem dhe a ka ai nje cilesi te pranueshme?

10. Where are discharging the sewages?
    Ku I shkarkojne ujrat e zeza?

11. What is the water reservoir sources. There is any pollution source that can affect it?
    Nga furnizohet rezervuari dhe a ka burime ndotje ne kanalin furnizues apo rrethina.

12. There is in surroundings but close to dams, places for vehicles manoeuvring, disposal of construction material, disposal of debris etc? How big is the surface and who own or administrate it? Is there any access on it and if not, how can be insured the access? What the owners or administrators pretend or requests to permit the operators use the area for construction purposes.
    A ka ne rrethinat, afer digave, shesh per manovrimin e mjeteve, depozitimin e materialeve te ndertimit apo mbetjeve te ngurta? Sa e madhe eshte siperfaqja dhe prone/perdorim te kujt eshte? A ka ndonje akses me te, dhe nese jo, si mund te garantohet aksesi? Cfar pretendojne administratoret apo pronaret qe te lejojne operatoret ta perdorin sheshin per qellimet e ndertimit?

13. Who is the closed village to the Dam? How many inhabitants. Where are employed. What are the main cultures planted. Data about livestocks et.
    Kush eshte fshati me I afert. Sa banore. Ku jane punesuar Cfare kulturash mbjellin. Te dhena mbi blegtorine.

14. What other villages exploit the reservoir for irrigation purposes?
    Cilat fshatra shfrytezojne rezervuarin per ujitje?

15. Where the closed village take the drinking water and when are discharged the sewages.
    Ku e merr ujin e pishem dhe ku skarkon ujrat e zeza fshati me I afert me rezervuarin?

16. Where the closed village is taken the energy and is it appropriate for community requirements?
    Nga e merr energjine fshati me I afert dhe a eshte I pershtatshem per kerkesat e komunitetit?

17. In cases of construction or reconstruction of discharging channels, are any family that can be affected? Why and how?
    Ne rastet kur do te ndertohen kanalet e shkarkimit, a ka familje qe preken nga ky veprim? Si dhe sa?

Questionnaire for decision makers

Pyetjet Questions

1. **Cfare mendoni per situaten e bujqesise ne Shqiperi? Cilat jane problemet kryesore te komunes/rrethit tuaj?**
   What do you think of the agricultural situation in Albania? What are the main problems regarding this municipality?

2. **Cilet sektore te bujqesise kane potencialet me te medha per zhvillim ne Shqiperi? Dhe vecanerisht ne komunen/rrethin tuaj?**
   What sectors of agriculture do you think have the most potential for development in Albania? And in this municipality in particular?

3. **Cfare potencialesh dhe mangesish kane ndermarrjet dhe inisjativat vendore ne nivelin local (Infrastruktura, vendndodhja, urbanistika, ndertimet etj?**
   What potentials and limitations does local entrepreneurship have on the local level (the infrastructure, the location, urbanism, the construction etc.)? How do you rate the attitude of the municipality/local authorities towards the agricultural workers?

4. **Numri I ndertesave dhe popullsia ne zonen ku do te zhvillohet projekti. Sa vete/familje jetojne me te ardhurat nga bujqesia?**
   The number of the settlements, the population on the project location? How many live on agricultural production?

5. **Cilet jane pjesemarresit kryesore (kompanite, kooperativat, shoqatat, strukturat shteterore) ne fushen e bujqesise ne zonen e projektit?**
   Who are the key participants (companies, cooperatives, associations, state structures) in the field of agriculture in this area?

6. **A keni dijeni te mjaftueshme per projektin e zhvillimit te ujitjes ne zonen tuaj? Nese po, kush ju ka informuar apo nga jeni njoftuar? Cfare mendoni per idene kryesore – Rritjen e perfitimit nga produktet bujqesore duke permiresuar manaxhimin dhe modernizimin e sistemit te ujitjes. Ne cfare niveli ju mendoni se do te kontribuoje ky projekt ne arritjen e ketij qellimi? Sa real ju duket? Mendoni se ky veprim do te permiresoje prodhimin bujqesor? Nese jo, pse? Nese po, pse dhe ne cfare menyre (me shume prodhim, rritje e te ardhurave, rritjen e larmise se kulturave bujqesore, me pak shpenzime per krahe pune? Kush mendoni se do te ndikohet me Shume? Nese jo, pse?**
   Do you know much about the Project for irrigation development on this location? If so, who has informed you, how have you found out? What do you think about the main idea – «Increase the profitability and productivity of agriculture by means of the improved management and modernisation of the irrigation system»? To what extent do you think this will contribute to the achievement of this goal? How realistic is it to expect that? Do you think that this will affect the agricultural production? If yes, how and in what way (more crops, more income, growing of different cultures, less expensive work force ....)? Who will be affected the most? If not, why not?

7. **Cfar lloj ndikimi do te kete ky project ne bujqesine e komunes apo zonave nen ujitje?**
   What kind of influence do you think this project will have on the agriculture in this municipality or area?

8. **Cilat do te jene te ardhurat afatshkurtera te projektit?**
   What are the main shortcomings of the project?

9. **Cfare problemesh mund te gjenerohen nga zbatimi I projektit?**
   What do you think the main problems could be in carrying out, namely the implementation of this project?

10. **Mendoni se zbatimi I ketij projekti do te shkaktoje problem me pronen? Nese po tek cili? Mendoni se duhen shpronesuar disa territore per te realizuar projektin? A mendoni se do te jete I nevojshem per nje rilokim te perkohshem apo perhershem te popullsise per zbatimin e projektit?**
    Do you expect that the implementation of this project will lead to legal property problems? If yes, which ones? Do you think there is a need to expropriate some parts of the land in order to complete the project? Do you think that there is a need for a possible temporary/permanent relocation of the population in order to implement the project?

11. **Keni ndonje mendim per nje zgjidhje me te mire te problemit te ujitjes ne zonen tuaj?**
    Do you have a suggestion as to how to solve the irrigation problem on this location in the best manner?

12. **Sipas opinionit tuaj, cfare roli/detyre duhet te kene Shoqatat/kooperativat ne projektin per zhvillimin e ujitjes?**
    In your opinion, what kind of role/task should Associations/Cooperatives have in the Project for irrigation development?

13. **Duke marre parasysh gjithshka dini per kete project dhe cfare pritet nga rezultatet e projektit, cila eshte pritshmeria juaj per efektet e projektit persa I perket punesimit? A prisni nje rritje te konsiderueshme te punesimit? Ne cfare profili? A ka nevoje per eksperte te ketij profili? Cfare profili? A ka nevoje per eksperte te profileve te ndryshme dhe duhen zhvilluar trajnime per to?**
    Taking into account all that you know about this project and your expectations regarding the results of the project, what do you expect regarding the effects of this project on employment? Do you expect a significant number of new jobs? What profile? Is there a need for experts of certain profiles/employee training?

14. **A ka toka te dhena me koncension ne territoret qe perfshihen nga projekti ne fjale per zhvillimin e ujitjes? Nese po ne cfare masa kompanite koncesionare I plotesojne kriteret e percaktuara nga marreveshja koncesionare?**
    Are some companies or entities administrating the lands under considered by irrigation development project, upon concession agreements? If yes, have they meet the criteria of required by the concession?

15. **Cili eshte bashkepunimi mes kompanive dhe komunes? A kane ato ndonje problem? A prisni jut e shfaqet ndonje problem? A prisni jut e shfaqet ndonje problem mes tyre gjate zbatimit te ketij projekti?**
    What is the cooperation like between the municipality and the companies? Are there any problems? Do you expect any problems? Do you expect any problems in the implementation of this project regarding that?

16. **Cilat jane marredheniet mes kompanive ne fjale dhe komunitetit? A kane problem mes tyre? A prisni te lind ndonje problem ne kete drejtim nga zhvillimi I projektit ne fjale?**
    What is the cooperation like between the companies and the local population? Are there any problems? Do you expect some problems in the implementation of this project regarding that?

15.5 Annex D - Further details on Protected Areas

Detailed list of Protected Areas (in Albanian)

RRJETI I ZONAVE TE MBROJTURA NE SHQIPERI

VITI 2010-Prill

Nr.	Kategoria	Nr.ZM	Qarku	Rrethi	Emëri i ZM	Miratimi	Sipërf. Ha
1	I	1	Kukës	Tropojë	Lumi i Gashit	VKM[1] nr.102,datë 15.01.1996	3,000.0
2	I	2	Gjirokastër	Gjirokastër	Kardhiq	VKM nr.102,datë 15.01.1996	1,800.0
	SHUMA I	***2***		***Rezervat Strikt Natyror/Rezervat Shkencor***			***4,800.0***
3	II	1	Shkodër	Shkoder	Thethi	VKM[4] nr. 96,datë 21.11.1966	2,630.0
4	II	2	Dibër	Dibër	Lura	VKM[4] nr. 96,datë 21.11.1966	1,280.0
5	II	3	Vlorë	Vlorë	Llogara	VKM[4] nr. 96,datë 21.11.1966	1,010.0
6	II	4	Korçë	Korçë	Bredhi i Drenovës	VKM[4] nr. 96,datë 21.11.1966	1,380.0
7	II	5	Berat	Berat	Mali i Tomorrit	VKM nr.102,datë 15.01.1996	4,000.0
8	II	6	Kukës	Tropojë	Lugina e Valbonës	VKM nr.102,datë 15.01.1996	8,000.0
9	II	7	Durrës	Kruje	Qafë Shtamë	VKM nr.102,datë 15.01.1996	2,000.0
10	II	8	Dibër	Mat	Zall Gjocaj	VKM nr.102,datë 15.01.1996	140.0
11	II	9	Korçë	Korçë	Prespa	VKM[3] nr. 80,datë 18.02.1999	27,750.0
12	II	10	Vlorë	Sarandë	Butrinti[b]	VKM[7] nr. 693, datë 10.11.2005	8,591.2
13	II	11	Tiranë,Durres	Tiranë,Kruje	Mali i Dajtit[a]	VKM[11] nr.402,datë 21.06.2006**	29,216.9
14	II	12	Fier, Tiranë	Lushnjë, Kavajë, Fier	Divjakë-Karavasta[j]	VKM[13] nr.887,datë 19.10.2007	22,230.2
15	II	13	Elbasan, Diber	Librazhd,Bulqize	Shebenik-Jabllanice	VKM[14] nr.840,datë 21.05.2008	33,927.7
16	II	14	Gjirokastër, Korce	Përmet, Kolonje	Bredhi i Hotovës-Dangelli[h]	VKM[15] nr.1631,datë 17.12.2008	34,361.1
17	II	15	Vlore	Vlore	PKD "Karaburun-Sazan"	VKM nr.289, datë 28.04.2010	12,570.8
	SHUMA II	***15***			***Park Kombetar***		***189,087.9***
18	III	1	Shqipëri	Shqipëri	BioMonumente Nr.	VKM[5] nr.676,datë 20.12.2002	348.0
19	III	2			GjeoMonumente Nr.	VKM[5] nr.676,datë 20.12.2002	398.0
	III				***ShumaBio&Gjeo Nr.***		***746.0***
20	III	3	Gjirokastër	Gjirokastër	Bredhi i Sotirës	VKM nr.102,datë 15.01.1996	1,740.0
21		4	Gjirokastër	Gjirokastër	Zhej	VKM nr.102,datë 15.01.1996	1,500.0