



DEMONSTRATION PROJECT

Selected Measures Towards Integrated Land and Water Management in Upper Tisza, Ukraine

VELYKY BYCHKIV (UKRAINE) – BOCICOIU-MARE (ROMANIA)



INCEPTION REPORT

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ACRONYMS

BM	Bocicioiu Mare
GEF	Global Environmental Facility
ICPDR	International Commission on Danube River basin Protection
RO	Romania
VB	Velyky Bychkiv
UA	Ukraine
UNDP	United Nations Development Programme

Executive summary

Title: Selected Measures Towards Integrated Land and Water Management in Upper Tisza, Ukraine

Countries: Ukraine - Romania

Lead partner: Zakarpattya Oblast organization of All-Ukrainian Ecological League

Geographic area: Upper Tisza river basin (Velyky Bychkiv – Bocicou Mare)

Overall objective: to demonstrate innovative and cost-effective solutions to the typical environmental problems faced in Upper Tisza floodplains with guidelines for their further replication.

Objectives and outputs:

Output 1. *Communal waste management system for Velyky Bychkiv and Bocicou Mare is improved*

Objective: to improve communal waste management system in Velyky Bychkiv and Bocicou Mare for preservation of floodplain ecosystems and sustainable use of environmental services:

- to decrease the total amount of garbage of the Tisza floodplain at its source by the means of environmental campaigning and establishing garbage collection facilities (both for VB and BM);
- to introduce separate plastic waste collection in VB.

Output 2. *Local Flood Risk Management Plan is developed and implemented*

Objective: to improve management of local streams during flood events in order to mitigate risks and damages

Output 3. *River and lake habitat in UA and RO are revitalised*

Objective:

- to develop methodology of stream (biotope) restoration after unsustainable forest management and practically implement it for selected mountainous streams in UA
- to create ecological path for youth and promote lake restoration in RO

Output 4. *Water gauging station in Kobyletska Polyana village is re-opened*

Objective: to establish the only water gauging station for improvement of flood forecast, water balance assessment of Shopurka tributary of Tisza for flood mitigation purposes

Output 5. *Local waste water facilities for boarding school complex in Velyky Bychkiv are designed and constructed*

Objective: to support the construction of waste water treatment facilities for boarding school in Velyky Bychkiv in order to practically demonstrate possible local and cost-effective biological treatment facilities and to decrease direct inflow of nutrients into transboundary part of Tisza river.

Project starting date:

Project duration: 18 months

1. INTRODUCTION

1.1 GEF umbrella project context

The UNDP/GEF project “**Integrating multiple benefits of wetlands and floodplains into improved trans-boundary management for the Tisza River Basin**” provides support in developing an integrated strategy for water quality and water quantity. The UNDP/GEF project also implements demonstration projects that test the multiple environmental benefits of wetlands to mitigate impacts of floods and droughts and help to reduce nutrient pollution. Implementation of demonstration projects should showcase concrete advantages of an integrated land and water resource management at the community-level that will also lead to improved *livelihoods of local communities*. In case of the current project the mentioned above advantages include better management in times of flood, better waste management techniques including the initialization of separate plastic collection, better wastewater management, better mountainous creek management and improved hydrological prognosis. The results will also be an important step in delivering changes to current policies on floodplains in the Upper Tisza River Basin. The practical work is undertaken through the local organization, namely Zakarpattya Oblast Branch of All-Ukrainian league. The project is organized under the umbrella of the ICPDR as this organization is responsible for the management of the whole Danube River Basin and has established the ‘Tisza Group’ to manage the Tisza River Basin.

The project area – UA-RO border part in Upper Tisza according to Analysis of Tisza River Basin 2007 is assessed as *water body at risk*. Therefore the need for actions for this area will be stated in the Tisza River Basin Management Plan and the corresponding Program of Measures.

Besides, ICPDR Tisza EG has defined the following priority issues in connection to *integration on water quality and water quantity* is the following: groundwater depletion because of over abstraction, increased irrigation and related surface water abstraction, hydromorphological pressures from flood protection measures, accidental pollution due to flooding, loss of wetlands, impacts on climate change on low water flow and solid waste. Out of this list, 3 will be addressed in frame of this project, namely hydromorphological pressures, accidental pollution due to flooding and solid waste. As far as this demonstration project is a part of MSP project, it will also assist with nutrient reduction (which is one of the main goals of the MSP project) by establishment and popularization of local wastewater treatment facilities based on the best available techniques (deep biological treatment). It will also promote reduction of floods by creating for the first time in Ukraine local streams management plan and flood hazard and flood risk mapping.

1.2 Changes in project environment that may affect the project implementation

The project proposal was prepared in times when the consequences of the economic crisis were not clear yet. This crisis heavily influenced the economy of Ukraine and project as well in terms of available co-financing. Some stakeholders are not able to provide co-financing as it was planned.

The co-financing issue especially affects the component related to the wastewater treatment facilities. In our project proposal it was written: “*The project plans to pay for the design of the wastewater facilities, but their construction is within financial responsibility of Velyky Bychkiv council and Rakhiv rayon administration. But such situation has some advantages, namely the project by investing 10% into design can fundraise the rest 90% of needed investments*”. At present such co-funding is not available therefore this component was changed to smaller scale one – planning and construction of wastewater treatment facilities for the local unit – boarding school.

Another change in the project environment can be considered as favorable one. The issue of solid waste management became more and more national issue. In March 2009 there was multilateral meeting (Ukraine, Romania, Hungary, Slovakia) “*Solid waste treatment and pollution of transboundary waters*”. There it was stressed the need to joint actions at the national levels to prevent solid waste entering the rivers. Therefore such initiative as in frame of our project is getting more and more attention. There are two similar initiatives of a smaller scale implemented in Rakhiv rayon (Kostylivka and Drotinsti village) and there is a clear demand for the local strategy for solid waste management to be developed in the frame of the project. We already got a number of requests to share the findings.

1.3 Activities during the Inception Phase

During Inception phase the following activities took place:

- 12th Tisza Group meeting and 2nd Workshop of the UNDP/GEF Tisza MSP project (8-9 April 2009, Budapest, Hungary)
Presentation of the demo project and discussion of the contractual issues
- 5th PP Expert Group Meeting (14-15 April, Belgrade, Serbia)
Clarification of the public consultation process to be arranged in Upper Tisza basin and clarification of the requirements to the Danube Day celebration this year
- Field surveys in frame of preparation of Inception report (1-10 May, Velyky Bychkiv, Ukraine, Bocicoua Mare, Romania) (the results are presented in the components description)
 - Development of solid waste management strategy in Ukraine and Romania with the involvement of the Check expert Mr. Pavel Novak (component 1)
 - Collection of the primary field data for local flood management and identification of the scope of work for flood mitigation in Velyky Bychkiv (component 2)
 - Re-identification of the mountains creek to be restored taking into account the future forest cutting strategy of forest department in Ukraine and identification of the lake in Romania for establishment of ecological route (component 3)
 - Re-allocation of automatic gauging station (from Dilove, where such station is already to be installed in frame of another project to Kobyletska Polyana) and site visit to identify the exact location of the station (component 4)
 - Site visit to the boarding school, where it is planned to install local wastewater treatment facilities (component 5).

The results of the field surveys were widely discussed with the local stakeholders, including the village councils and other stakeholders.

- Inception workshop (11 June 2009, Velyky Bychkiv, Ukraine)
(the respective Minutes of meetings will be attached after it)

2. METHODOLOGY: Project activities and work plan by each component

Component 1. Improvement of communal solid waste management system for Velyky Bychkiv and Bocicioiu Mare

Objective: to improve communal waste management system in Velyky Bychkiv and Bocicioiu Mare for floodplain ecological potential preservation:

- to decrease the total amount of garbage of the Tisza floodplain by the means of environmental campaign and garbage containers purchasing (both for VB and BM);
- to introduce separate plastic collection in VB.

Activities:

1.1 Review of the present waste management system in VB and MB, identification of the spots for garbage containers and containers for plastic;

Velyky Bychiv review

Waste production

There was a pre-screening of data related to waste management. The information on waste production is rather incomplete, though, as the amount of waste managed by a waste management service is low and there is no statistics. A calculation based on waste production factors per capita was done to approximate the waste production and waste composition. The amount of waste arising in Velyky Bychiv per year is estimated at about 2 thousand tons. This amount may grow further due to increase of incomes and development of local economy.

The essential focus was on plastics, which are the main source of littering on the banks of river Tisa. The production of plastics is estimated at about one hundred tons per year. Beverage plastic PET bottles represent approximately quarter of this amount, LDPE light packaging (bags, membranes) represent another approximately quarter of plastics. The rest of plastics are other packaging, consumer goods from plastics and other plastics used in households. The essential problem for Tisa river are PET bottles, that are brought to long distances and pollute banks tens of kilometres below VB. The plastic bags and membranes are also visibly polluting the environment.

Estimate of composition of plastics in MSW in Velyky Bychiv

Composition of plastics by types	Share of plastics	Comment
PET bottles	20 – 30 %	clear or various colours
LDPE bags and other packaging	20 – 30 %	clear or various colours
Other plastics	40 – 60 %	PS, HDPE, PP, PUR, PVC, others
Estimated production of plastics	105 t	
Share of PET bottles	26 t	approx. 25% of plastics
Share of LDPE bags and other LDPE packaging	26 t	approx. 25% of plastics

x) percentage adapted from waste analyses in rural area in the Czech Republic, 2001

Waste collection

Local company Schuravi collect MSW about 500 containers or bags of volume typically 120 l, may be also some smaller or larger (80 l, 240 l). There are several containers per site in some cases. The containers are collected once a week by a truck with 6 m³ press mechanism. The cost of this service is 12 Hr/month per container for the 120 l container and this service is paid directly by the user to the provider. The containers are sold to household at a discount prices to stimulate their purchase. The amount of waste

in case of average volume of container 120 l and 500 containers would be about 3 thousand m³/year, which may be about 500 tons a year. This is under the assumption that the containers are collected full. There is also collection organised by VB municipal services. They collect MSW collected in bags on tractor with trailer. The cost is 2 Hr per bag, with payment directly to the operator. The amount collected is unknown.

There is no separate collection of MSW materials, except of informal collection of metals.

Waste treatment

The waste collected is brought to local dumpsite. The dumpsite is managed by VB communal services. The service is free for Velyky Bychiv citizens. The area of dumpsite is about 2 hectares, with potential extension by another 1 hectare. The dump is shallow, between 0,5 – 3 m. There is potential to extend the dept of the dump to about 10 meters. The dumpsite is protected from water flood by a ditch from North-West. The dumpsite boundary on the South-East is formed by a former railway. The bottom of the site is formed by gravel, ground water table reached in a hole on the site is about 2 m below the surface. It is clear, that all leachate from the site goes to the ground water, but there are no buildings and wells below the site. The impact to environment is unknown, but there is a reasonable probability that pollution disperses in the environment below the landfill, as long as in the shallow landfill prevail aerobic processes, that result in biological stabilisation of most of organic pollution. In the case of hazardous waste dumping the pollution may concentrate in the dump and/or after release pollute ground water.

Waste treatment of potentially separately collected MSW materials is not available locally. Metals can be sold by existing trading channels. The closest point of sale of plastics seems to be in Vinogradovo, which effectively excludes possibility of informal collection of plastics. Other outlets for recyclables are unknown.

There is a clear need for introduction of a regular MSW collection system. “Voluntary” participation in a MSW collection scheme results in low participation and dumping of waste along the river and other informal places. Stronger enforcement of existing sanitation standards is necessary to make the people and businesses to take part in a collection scheme. On the other hand, the waste management infrastructure (collection system, landfill) is in place, so after some stimulus is provided to local citizens and businesses, there is a good chance that the collection and disposal system will be able to serve the needs of the community. There is also a good degree of awareness of the proper waste management practice among people, as there is a large exposure to experience from other countries with working waste management systems.

Bocicioiu Mare review

Waste production

There was a pre-screening of data related to waste management. The data indicate that there may be about 15 - 20 tons of MSW a month. This is about 200 tons a year. The waste collected probably does not include much organic waste and mineral waste, due to the long service interval and the way of collection (see below).

Waste collection

Every household takes part in the collection system. MSW is collected regularly every week. Households place bags with waste on the street before the collection and staff of the waste collection company load the waste onto the collection vehicle. Households pay 2 lei per person and month to municipality for the waste collection service. There are some waivers of the payment for poor citizens and children. The amount collected is sufficient to cover the cost of the service. The service company was selected in a tender from several offers. Local shops are also provided MSW collection; interval of collection is once a week. There is a lack of containers for waste collection. Even the local schools do not have waste containers. There is no separate collection of waste except of some informal metals collection.

Waste treatment

All the collected waste is brought to a landfill placed about 25 km from Bocicioiu Mare. Regional government prepares a regional waste treatment centre. The centre should be ready within two years.

The MSW collection system is in place and serves principally all population. There is no separate collection, but it is supposed to be started once the regional waste treatment centre is ready. There is no point in starting separate collection before there is a suitable treatment option.

Time limits: May 2009

1.2 Purchasing of containers for general waste and plastic for VB and MB;

Velyky Bychyv

Mixed MSW

The MSW collection scheme in VB is patchy and voluntary. There is a need to provide an example of proper MSW collection, including its advantages (cleanness, comfort for households) and including adequate enforcement support to the waste collection system using local standards. *It is proposed to make a demonstration project along the main streets running through VB from the West to the East. There are approximately 300 houses, that will be offered 120 l containers for mixed MSW collection for a symbolic rent (e.g. 1 Hr) or for free.* Each of the households will have a written agreement with municipality on rent of the container and on compulsory participation in the municipal waste collection system, as they will be required to use some of the MSW collection services provided in VB in the same time. Participation of the households in the pilot are in the MSW collection system will be monitored and if necessary enforced by relevant enforcement instruments.

The advantage of the scheme to citizens will be in increased comfort of MSW collection and disposal and increased cleanness of their neighbourhood and effectively free provision of the waste containers. On the other hand, the households will have to pay money for the MSW collection. The tariff will be monitored and/or if necessary intervened by the municipality of VB. It is clearly duty of the municipality to supervise, that the tariffs are fair and reflect the cost of the service. An alternative to this system would be to collect money for MSW management directly from citizens by municipality (which is in fact the case in BM and vast majority of municipalities in the Czech Republic and other EU countries), and purchase the waste management services by the municipality. In such a case, it is strongly advised that the municipality makes a public tender for MSW collection service.

Separate plastics collection - Collection from households

The calculations made indicate that the amount of PET bottles in MSW ranges around 26 tons/year and for LDPE bags and membranes about the same. There is a relatively steady market for PET bottles. Market for LDPE materials is more volatile, with dropping or diminishing demand for certain kinds of LDPE from time to time. Also, the most problems with littering arise from PET bottles. Therefore it is recommended to start separate collection from PET bottles, while the LDPE could be added when the collection system is well introduced and the outlets for LDPE are better available.

The plastics collection is rather cumbersome because of relatively low density of the material. This is the truer for PET bottles. To achieve acceptable effectiveness, it is necessary to use press vehicle or large containers for plastics collection. Even then the cost of transport per tone is much larger than the one of the mixed MSW. On the other hand, transport of mixed MSW becomes more effective in areas with separate collection of PET bottles (or plastics as such), as the density of mixed MSW increased due to absence of part of the light fraction. As the amount of plastics is relatively low, it is recommended to use 1100 l containers for PET bottles separate collection. The containers colour should respect the European colour convention for plastics, i.e. the containers should be yellow or should be black with yellow lids.

The theoretical number of containers needed is 23 for collection of all PET bottles in the whole Velyky Bychkiv village and one week collection interval. It is rather unrealistic, that such efficiency of collection system will be achieved; on the other hand the system has to have some flexibility and even some reserve for the future addition of LDPE bags and membranes to the collection portfolio. It is recommended to place 20 containers in the VB streets, 17 of which will be placed along the main road from the West to the East or close to the main road (in areas, where the main road boundaries the river Tisa) and 3 will be placed in upper and lower parts of VB (2 in the residential area North – East of the main road and 1 in the area South – West off the main road). It is anticipated that people will bring the empty PET bottles on their way to shops, which are located chiefly on the main road. The proposed distribution of PET bottles also supports the pilot project of distribution of the 120 l containers for MSW, allowing the citizens to opt easily for separate collection of PET bottles, instead of putting them in the rubbish.

Municipality obliged to bear the costs the PET bottles collection. It is anticipated that the collection interval and final placement of the containers will develop over the time. In the beginning, it is expected that a 2 weeks collection interval should be sufficient. Where there is larger amount of plastics collected, the stand will be doubled by a container from a place with a low amount of plastics collected.

Collection from businesses

Up to a half of plastic PET bottles is supposed to originate from local shops, cafes, restaurants. *Municipality selected 31 of these shops, largest by scope of trade, and these will be equipped by 240 l containers (plastic made, yellow colour) for PET bottles collection, one per each shop.* The shops will bear to cost of plastics collection on their own. There will be an individual agreement between the municipality and the business on provision of the container (at a symbolic rent or for free), obliging the shop owner to take part in a collection scheme. The shops may opt out from the scheme with containers by collection of PET bottles in their own bags and transporting the bags to the treatment centre individually. The PET bottles collection will be monitored by the municipality.

Budget breakdown

Item	number of units	unit cost	total cost in USD	Comment
Container 1100 lt. for public plastic collection	20	200	4000	Yellow containers from plastic, on 4 wheels, two holes with diameter cca 15 cm in the front side of the lid, opening lockable lid with locks, standard loading mechanism, not damaged
Container 120 lt for general waste utilization in the main street	300	25	7500	Black containers from plastics, on 2 wheels or without wheels, round or rectangular base and lid, complete with lid, not damaged
Container 240 lt for plastic collection from main polluters	31	25	775	Yellow containers from plastic, on 2 wheels, one hole with diameter cca 15 cm in the lid, opening lockable lid with lock, standard loading mechanism, not damaged
Press 8 tons	1	5000	5000	New press with manual loading, powered by three phase electricity, hydraulic pressing mechanism, 3 years guarantee with free service on site
Total			17275	

Bocicioiu Mare

Preparation of citizens for separate collection of MSW should start before the recycling is available. Households awareness will prepare ground for quick start of a collection scheme in the not fare future. It is proposed that the awareness campaign starts by education on MSW separate collection at schools.

Each of the four schools will be equipped by a set of containers for mixed MSW (black colour), paper (blue), plastics (yellow), glass (green). The containers will be 240 litres except of those for glass that will be only 120 litres. The containers will have posters (large stickers) on them explaining what type of material belongs to the specific type of containers. In addition it is planned to put additional containers in the public zone near the lake, where in frame of the another component it is planned to arrange the ecological path.

Budget breakdown

Item	number of units	unit cost	total cost in USD	Comment
Container 120 lt	8	40	320	New green containers from plastics, on 2 wheels or without wheels, one hole with diameter cca 15 cm in the lid, round or rectangular base and lid, complete with lid, not damaged
Container 240 lt.	4	60	240	New yellow containers from plastic, on 2 wheels, one hole with diameter cca 15 cm in the lid, standard loading mechanism, not damaged
Container 240 lt.	4	60	240	New blue containers from paper, on 2 wheels, standard loading mechanism, not damaged
Container 240 lt.	4	60	240	New black containers from plastic, on 2 wheels, standard loading mechanism, not damaged
Total			1040	

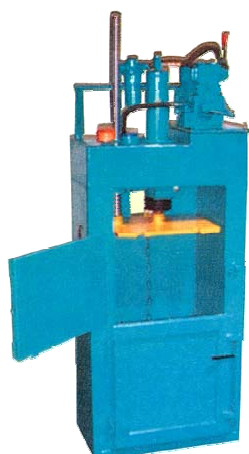
Timeframe: June-August 2009

Outputs: installed containers

1.3 Purchasing of press installation to decrease the volume of the plastic and to make it a product for sale; trainings on use of press and additional sorting of plastic before pressing;

Purchase of the press

According to the current market analysis and price comparison it was selected to buy the following press **Б3118 "МИДИ"** directly from the factory specialized in presses in Ukraine (Ovidiopol) <http://www.katran-pako.com.ua/>. The company-seller will also install the press and provide 1 year warranty.



Characteristics:

- Pressing power – 8 tons
- Size of the pressed plastic: 750 x 620 x 900
- Weight of the pressed plastic: up to 140 kg
- Capacity: 0,45-0,7 tons / hour
- Size: 950 x 820 x 2450

Picture 1. The press Б3118 "МИДИ" and its characteristics

Reconstruction of the building

Reconstruction of the building equipped by the press is to be done by the municipality as their in-kind contribution The reconstruction will include:

- repair to windows
- extending width of the front door to about 110 cm (to allow the bags with plastics in)
- concrete bed for the press (as per instructions of the press supplier)
- electricity connection, 3 phase, all electric wiring, lights, sockets, electricity meter connection, permit from electricity supplier
- a plastic, metallic or impregnated textile roof over the outside sorting area, approximately 6 x 6 m
- concrete, asphalt or at least gravel or similar firm cover of the 6 x 6 m sorting area

Arrangement of the sorting

In Velyky Bychkiv, the PET bottles will be brought to treatment centre, consisting of a manual sorting place, press and an open store. PET bottles have to be sorted by colours (in principal clear, blue, green, brown, optionally other colours). Any other materials collected with PET bottles have to be removed and send to a landfill. A container or a bag for the sorting residues will be provided and serviced by VB municipal services to remove the sorting residues.

The PET bottles will be sorted by colours to big bags (1 m³ textile bags). Closed bottles will have to be penetrated by a sharp metallic tool to allow the air out in the press. Full bags will be brought to the press in the centre building. One m³ is approximately one load of the press. The press will produce bales of about 20 kg weight. The bales will be stored outside the building in piles separately by colours. There is no risk of theft as the purchase of this material is done only in whole-sale. It is recommended, thought that in a due course the store is protected by a fence.

The sorting will be arranged by the VB municipal service. It is estimated that 2 persons will be employed by the sorting activities, part time. It is important that the material collected is sorted out continuously, as a large heap of accumulated material may create visual intrusion to neighbourhood.

Timeframe: July-August 2009

Outputs: installed press and plastic utilization system is arranged

1.4 Joint Ukrainian-Romanian environmental campaign “Two Banks – One Clean Tisza” aimed at cleaning Tisza floodplain from the garbage;

It is planned to select the same period of time (preliminary July 2009 and July 2010) for arrange children at both sides of Tisza to collect the waste on the Tisza banks. The banks are so close in the several places than it is possible to see each other. The children will have prizes for their activities. The project will also arrange all practical issues like providing bags and gloves to children, arrange the transport for the children and the truck to utilize all collected garbage at both sides of the Tisza.

It is planned to invite different UA and RO media (TV, newspapers) to widely highlight this event.

Timeframe: September-October 2009 and April-May 2010

Outputs: clean Tisza banks Sources of verifications: photo and media reports

1.5 Educational campaign on separate plastic collection in VB

Velyky Bychyv

The introduction of separate collection of plastics on public places will have to be explained to citizens by a multi channel marketing, including

- public announcement by the municipality,
- competition between school children on biggest amount of plastic collected
- local TV,
- leaflet on public places and 3 large big boards

- information on containers and leaflet to each home and business.

Most of this marketing will be done by municipality in the frame of their normal operations. The project will finance a leaflet to households and information on containers.

The introduction of separate collection of plastics for shops and restaurants will have to be negotiated individually between municipality and the owners. An information letter and individual agreement negotiation is envisaged.

The demonstration project of mixed MSW collection in houses on the main road will have to be communicated to the households by a letter from municipality and individual agreement negotiation is envisaged. Households, who will not want to take part in the project, will have to prove where they put their MSW. Although the project should positively motivate people to join the municipal MSW management system, sanctions should be used against people violating sanitation regulations by improper MSW disposal.

Bocicioiu Mare

Campaign in schools

Information posters / large stickers on what belongs and what must not be put in specific type of container will be placed on each container in the schools. The appropriate materials for different types of containers are following: paper - cardboard, printed paper, paper packaging; plastics - plastic bottles, plastic membranes, other plastic packaging; glass - glass bottles, window glass. On the other hand, there are materials that must not be put in the containers: paper - dirty paper, combined materials with plastics; plastics - dirty plastics, bottles for mineral oil products, combined materials with metals, fibreglass; glass - dirty glass, porcelain, ceramics, combined materials with metals, light bulbs.

Seta of waste samples (clean materials) will be provided for children to test their sorting abilities (both samples of materials that belong to separate collection containers and that must not be placed in the separate collection containers and have to be put in the mixed waste. Children will play game on sorting recyclables and will naturally understand the principles of separate collection of waste at home. These activities will be part of an ecological lesson. A part of the lesson will also be explanation, what is use of separately collected recyclable materials. The particular output of this part of information campaign will be understanding of children, that separate collection of waste materials is an easy and natural activity, that helps to save raw materials, energy and hence nature around us.

Campaign around lake

Local lake will be a part of an ecological trail along a meadow stream, created within the project. There will be four containers for MSW placed around the lake, together with small posters explaining long life of various materials in nature (glass - thousands of years, plastics - tens of years, paper - months, metals - years) and need to collect the waste to protect beauty of the nature for all people. The ecological trail will be also used for education of school children.

Timeframes: August 2009 - November 2009, March-May 2010

1.6 Selling of plastic

It is worth to mention that it is profitable for the company to come to pay for the plastic, if 2 tons of plastic is collected. Therefore, this figure is considered like a milestone for the project. It is planned to collect at least twice by 2 tons of plastic (target date - December 2009 and September 2010).

1.7 Production of the TV-programme (30 min) concerning the waste and plastic collection campaign as well as other outputs of the project

The main goal of the TV-program is to demonstrate existing ecological problems and innovative and economic their solutions. The possible title of the movie: “*Two banks... one clean river*”.

Activities:

- 1st stage – showing the baseline situation with all project components (summer 2009)
- 2nd stage – showing the activities, done in the frame of the project (construction works, plastic collection process), comments of experts, key stakeholders and local citizens in Velyky Bychkiv and Bociocouau Mare (during life time of the project)
- 3rd stage – showing the practical results of the project (September 2010).

Budget breakdown:

Item	Cost, in USD
Fees (journalist, operator)	420
Fuel	130
Rent of Car	150
DVD, min - DV	20
Per diems	280
Total:	1000

Component 2. Development and practical implementation of Local Flood Risk Management Plan

Velyky Bychkiv village is located in mountainous part of Zakarpattya at the hills of Carpathian mountains. As many other settlements in this region, the village covers relatively large area and population distribution within the village is different: most of the houses are located along rivers, but some houses are on the hills far from each other. Velyky Bychkiv is located along Tisza river and its right-side tributary Shopurka. Ukrainian Velyky Bychkiv is located on the right side of Tisza (left side of the village became independent and part of Romania since 1919 just after end of World War I) and divided on two parts by river Shopurka: eastern upper and western lower parts. The catchment area of eastern part of Velyky Bychkiv is about 5 km².

Velyky Bychkiv has long history of floods, caused by Tisza and Shopurka. During many years, the number of engineering constructions was made along rivers: dikes, bank enforcement, sluices. At present, the village is quite safe from the sides of both rivers. However, State Program of Integrated Flood Protection in Zakarpatska oblast 2002-2015 envisages further constructions along Tisza river.

Local hydrographic network within eastern part of Velyky Bychkiv includes two streams of length 2-3 km each: Mlynivka and nameless stream flowing along Duhnovicha street (further Duhnovich stream). Two of them merge just 100 m from Tisza and flow under the road and through a newly built sluice (2008) in the dike along Tisza. Construction of the sluice allows avoiding backwaters from Tisza when water level in Tisza is higher than in local streams. Nevertheless, it doesn't solve the problem for all cases. As an example, in the times of extreme high flood (historical flood for this stretch of Tisza) during July 2008, the sluice was closed and water from Tisza didn't flow into the village. However, runoff of the two streams was much bigger than volume of their beds and caused overflowing in the mouth relatively plain part of the catchment. As a result, 29 houses from 37 in whole village affected by flood (officially claimed for reimbursement) were damaged because of these small streams.

Most of the time, the local streams are dry or their water discharge is insignificant. But during heavy rains, frequency of which is increasing according to the monitoring data, they can discharge up to 10

m³/s. In average 20 days within 1 year have daily precipitation bigger than 20 mm and lead to floods. In many places, beds of the streams are straightened and backfilled by sediments and domestic waste. Therefore, the flow running capacity is reduced.

After construction of the sluice, there are two scenarios of streams runoff into the Tisza. The first scenario is when water level in Tisza became higher than in streams and the sluice is getting closed (no backwater from Tisza, but flooding because of local runoff). The second scenario is when rain has very local character and streams flow into Tisza via open sluice (their water level is higher than in Tisza).

In the frame of the project it is proposed to prepare local Flood Risk Management Plan. It is aimed at reduction of the risk of adverse consequences for human health and life, the environment, economic activity and infrastructure associated with floods for this part of the village. The plan shall focus on prevention, protection and preparedness taking into account the characteristics of the particular sub-basin. It will also include promotion of sustainable land use practices and measures for proper maintenance of local stream network. The plan will be an integral part of national Flood Management Plan for Tisza river basin in compliance with EU Flood Directive and General Scheme of Development for Velyky Bychkiv. The plan will be developed taking into account the different scenarios and with close involvement of village council and consultations with local population. Besides Plan preparation, the practical measures for flood risk and damage mitigation will be conducted. Depending on proposed by the project, practical measures, cooperation from Velyky Bychkiv village council is expected: co-financing, providing goods and materials.



Picture 2. The stream at Duhnovich Street in Velyky Bychkiv

Another problem, which this part of the village is facing is lack of drinking water. At present, the wells are dried and the water only available for 2 months in the autumn.

Previously the villagers have created a special drainage channel called Mlynivka to have water in this channel to feed underwater levels. There was a special construction which redirected (without electricity using gravity) discharge of local small streams into Mlynivka. In 50-60s of the last century, the construction was ruined and the water disappeared from this part of the region. The villagers experience the heavy lack of drinking water.

At present, the situation has been worsened due to the fact that due to:

- gravel extraction from Shopurka, so its riverbed went down for 4 m, which will not allow any longer to use gravity for water supply into Mlynivka, the electricity expenditures for constant pumping of the water are large (not economically feasible);
- small creeks which fed Mlynivka in the past have disappeared due to human impact – constructions etc.
- natural riverbed of Mlynivka is partly under construction and partly overgrown and littered, so even in case of having water, it would be too polluted for drinking water purposes.

The village council has asked the research institute to develop the scheme of pumping water from Shopurka to Mlynivka. At present, this project is being discussed at the level of Zakarpattya Water Management Board. However, the project is very costly and there are doubts it can solve the issue.

The village council asked the project to suggest a proper solution for drinking water supply. Although it is out of the scope of work, the project promised to suggest a proper solution for this.

Objective: to improve management of local streams during flood events in order to mitigate risks and damages

Activities:

2.1 Hydrological and hydraulic investigations and spatial analysis of catchment and streams

- Collection of data on precipitation, water levels and discharge
- Field survey of riverbed inclinations, cross-sections of beds and valley
- Calculation of spatial characteristics: catchment, length, density of population
- Calculation of maximum riverbed capacity, water levels during flood of different probability, stream velocities and time of runoff from upstream to the confluence.

Output: analysis report on measured and calculated hydrological and hydraulic characteristics of the catchment

Timeframe: May-August 2009

2.2 Flood hazard and flood risk maps development, taking into account the different scenarios and local Flood Management Plan development

- Development of flood hazard maps including flooding zones, depths, velocity and flood extend
- Development of flood risk maps including social and communal infrastructure
- Development of local Flood Risk Management Plan

Output: flood hazard and flood risk maps and local Flood Risk Management Plan

Timeframe: September-November 2009

2.3 Development and implementation of measures for flood risk and damage mitigation

- Identification of practical measures, devoted to flood risk and damage mitigation (e.g. riverbed cleaning, bank enforcement, increase of volume of retention reservoir in lower part of catchment, sediments traps, pumps)
- Analysis of measures efficiency
- Implementation of selected measures

Output: list of measures with their efficiency analysis and implemented measures (works / constructions)

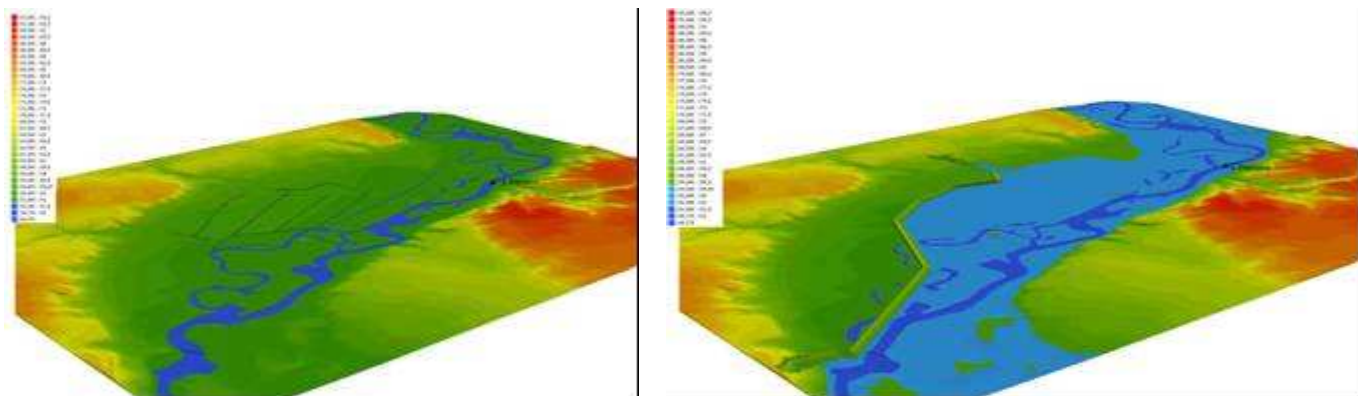
Timeframe: November-December 2009 (for development of the list of measures)

April – July 2010 (for their implementation)

2.4 Public campaign towards flood risk and damage mitigation

- Conduction of the workshop on flood scenarios and discussion of proposed measures with local inhabitants (December 2009)
- Public awareness raising on actions in times of floods and stream maintenance
- Printing of leaflets and installation of signs (April – May 2010)

Output: public acceptance of the proposed measures and increased public awareness, printed information materials.



Picture 3. Example of flood modeling

Component 3. Revitalization of a mountainous stream in UA and lake habitat in RO

Ukraine

Intensive unsustainable forest management in the basins of small rivers in Carpathians leads to destruction of biotic communities in river and stream ecosystems. They cannot survive under conditions of increased acidity of water due to decay of wooden residues, high turbidity and change of the riverbed due to wood transportation.

In frame of the project proposal preparation, the exact demonstration mountainous stream to be restored was changed several times. The first selected place *Dovgorynya* stream was lately replaced with another option because there Dilove Forestry is planning to continue forest cutting activities the next year so the all revitalization works conducted in frame of the project will not have long-lasting effect. The second selected place *Loschansky* torrent after appeal from the side of the project is partly restored by Dilove forestry itself. The third place *Skorodny* stream was considered as a final demonstration site due to several reasons:

- The general state of the stream is very poor (natural habitats of riverbed are heavily modified due to forest cutting activities; for 2 km it is heavily polluted with wooden residues;
- There is no natural biota typical for this type of mountainous streams. There are just xylophytes – indicators of poor state of the waters and poor hydrochemical and hydrological regimes;
- In the next 10 years, no further forest cutting activities are planned, so project revitalization activities will have long lasting effect.



Picture 4. Skorodny stream.

Skorodny stream is a mountains stream of the 2nd order – it enters the stream Bily, which is tributary of Tisza. The total length of the Skorodny is around 4,5 km. The co-ordinates of the stream mouth N 47°55'39.3''E 024°13'27.6''H 451m, forest cutting zones N 47°55'55.2'', E 024°13'34.4'', H 549m.

In 2005-2007 at Skorodny (forest cutting site # 18), there were forest cutting activities and wood transportation. The trees were cleaned from branches and needles also directly at the stream. The riverbed was stabilized with the wooden construction for equipment transportation.

As a result, the stream habitat has degraded. If for 400 m from the mouth, the stream looks moderately deformed, than for around 1 km, the stream is heavily polluted with the wooden residues. The area of the stream covered by the wood is larger (70%) than area covered by stone (the norm for such type of rivers is 3-7%). The wooden residues already negatively affected the hydrological regime, which in its turn negatively affected the biota.

Decomposition of wood of coniferous trees takes a long time and lead to phenols entering the stream. Increase of the temperature of water in streams in spring and summer lead to decrease of dissolved oxygen, so rheophil flora and fauna died. The present number of wooden residues in the riverbed show that mentioned above negative processes will develop further for the next 10-15 years. Besides this, wood as a substrate promotes the development of other animal forms – xylophytes, which live and transform wooded residues. Therefore fauna typical for stone and stone is replace with the fauna of xylophytes, which is not typical for mountainous rivers. As a result, habitat of the stream further degrades, and its revitalization is possible only in case of active renaturalization works.

The samples taken in the stream in May 2009 show its pollution: pH - 6,2. Concentration of O₂ is 7,9mg/l – 95% (it should be 140-160%), it shows that oxygen is used to oxidize organics. Exceeded concentrations of phenols were registered < 7, which corresponds to 4th class of water quality.

The biotope-friendly restoration methodology will be developed by Institute of Hydrobiology, and implemented by Dilove state forest enterprise under the supervision of the Institute. So this component contains on-job training for the local forest managers, which give additional value for the project sustainability. River habitat restoration will include introduction of invertebrates in the riverbed from the

undisturbed rivers. National Academy of Hydrobiology will arrange a special field survey to catch invertebrates and introduce them in the sources of the stream.

Objective:

- to develop methodology of stream (biotope) restoration after unsustainable forest management and practically implement it for selected mountainous streams in UA

Activities:

3.1 Physical cleaning of wooded residues from the riverbed

This stage will be conducted by Dilove forestry. The equipment rent will be provided by the Dilove forestry as an in-kind contribution.

Time schedule: June-August 2009.

3.2 Development of the methodology and restoration of biotope structure of the river.

- methodology development for mountainous streams
- creating of artificial cascades from local stone (not less than 3 cascades)
- increase of sinuosity of the stream by creating of side inlets (not less than 3 side inlets)

The works will be conducted by Dilove forestry under the guidance of Institute of Hydrobiology.

Time schedule: June-August 2009.

3.3 Introduction of invertebrates in the riverbed from the undisturbed rivers.

- Selection of reference conditions for such type of mountaineer rivers
- Registration of the permit for catching and introduction of water living resources in Zakarpattya ecological and fishery inspection.
- Catching of drift invertebrates and their identification in summer field laboratory and transporting to the upper part of Skorodny.

This stage will be conducted by Institute of Hydrobiology.

Time schedule: September 2009.

3.4 Supervision of the riverbed restoration

- Site visits and sampling analysis of the key invertebrates

Time schedule: October 2009, May 2010, October 2010, May 2011.

The last two field surveys (after the end of the project) are in-kind contribution of the Institute of Hydrobiology.

Indicators of achievement of the project goals: restoration of typical for such types of stream bottom fauna; presence of stable key indicator species; biological, hydrochemical and hydromorphological descriptors corresponding to the 2nd class of ecological status. If we will achieve here good ecological status, we can expect returning here of *river trout* and other fish, totally absent at present.

Romania

Romania does not experience the same problems with restoration of mountainous creeks after forest cutting activities due to stricter legal framework. Therefore, the activities in Romania in frame of this will be connected with creation of ecological path. In Bocicaua Mare there is a lake called "Teplysta", which is in good ecological status. It is used as a habitat for many birds as well as for fishery. There are islands in the lake. Project Partner in RO is Association of schools of commune of villages Bocicoiu Mare, Tisa, Crăciunești and Lunca la Tisa. It plans to conduct a number of practical actions to create ecological paths for children with posters and signs to the lake. The idea got support from the side of village council in Bocicaua Mare.



Picture 5. Lake in Romania

Objective:

- to create ecological path for youth and promote lake restoration in RO

3.5 To study biodiversity of the lake, to create the signs with the description of species

3.6 To construct the wooden bridge to the islands, to install garbage bins and to open the ecological path for the children.

Time schedule: September 2009 – May 2010.

Component 4. Re-opening of Water gauging station

Deviation from project proposal

The initial project proposal envisaged re-opening of closed in 1988 gauging station in Dilove village on Tisza by means of obtaining of equipment for the station and conduction of construction works. However, taking into account that another international Ukrainian-Romanian project “*Improvement of Flood Protection and Environmental Rehabilitation at Ukrainian-Romania Border Part of Tisza*” envisaged opening of automatic gauging station exactly in Dilove, we can consider that this activity is implemented already.

As far as there is another closed state gauging station at the project area in village Kobyletska Polyana at Shopurka, it is reasonable to restore its activities.

The reasons for re-opening of the gauging station at Shopurka in Kobyletska Polyana:

- Shopurka river is the right tributary of Tisza with total length of more than 40 km. The mouth of Shupurka river is located within Velyky Bychkiv (Ukraine) and directly influences the hydrological characteristics of Tisza within Bocicouau Mare (Romania).

- There are around 7,000 inhabitants in Shopurka basin. Here also one of the main hot spots of the Upper Tisza basin is located – Velyky Bychkiv saw-mill station.
- Opening of the station at Shopurka will provide the information about the development of flood situation at the basin of total area 286 km²
- It is also important to mention that there is NO other gauging station in Shopurka basin.

The proposed changes **will not influence the initial budget breakdown**. In the same time, the previous project task – to reopen station in Dilove will be implemented (although in frame of another project) as well as another one – to re-open station in Kobyletska Polyana will be implemented.



Picture 6. Place to installation of gauging station in Kobyletska Polyana

Objective: to re-open the water gauging station for improvement of flood forecast and flood management with flood mitigation purposes. It will allow to get a new information and to improve the flood preparedness in Shopurka and Tisza basin as well as to define discharge from water levels and other hydrological characteristics in the river.

Activities:

4.1 Purchasing of equipment and conduct construction works for its re-opening

- to agree technical conditions for location of the station (obtaining of the land, agreement with energy experts to connect the station to the energy source and road specialists) – August-September 2009
- to obtain construction materials to prepare the place for the station as well as to create conditions for the stations safety (construction of the steps to the river, wall protection etc.) September-October 2009
- to conduct all needed construction works.

The gauging station itself will be provided by Zakarpattya Hydromet as a part of con-finding.

4.2 Calibration of the equipment to order to use the old database from this station and conduction of trainings for its stuff;

- to calibrate the rows of the data from the old station to the new one; it will be done also as in-kind contribution from Zakarpattya hydromet – November 2009
- to conduct trainings for personal and to test the equipment – December 2009.

4.3 Official re-opening of the station with data transmission for the Ukrainian and Romanian organizations.

- to re-open the station – December 2009.

Output: gauging station is re-opened

Final output: monitoring data from the gauging station in Kobyletska Polyana is sent to Zakarpattya Hydromet, it is placed at its web-site and is available for Romanian partners.

Component 5. Design and construction of local waste water facilities for boarding school complex in Velyky Bychkiv

Deviation from project proposal

Taking into account the world economic crisis and its heavy impact on Ukraine, decrease in the funds inflow into state and local budgets, including the budget of the Velyky Bychkiv village, it is impossible for the moment to build wastewater treatment facilities for the whole district. Originally it was planned that the project will cover the costs of design of such network and the village council will fund its construction (approximate costs – 100,000 USD), but even in project proposal such risk of lack of co-funding was stated. Absence of the national funds in village council will make useless all project efforts because the design of such wastewater treatment facilities if not built right away will need to be corrected; the cost of materials for the network is different each year; infrastructure of the district is changing each year. Therefore it is not feasible to use the project money for the design of wastewater treatment facilities, which not clear when they will be built.

Therefore we propose to design AND construct local wastewater treatment facilities of just smaller scale, namely for boarding school in Velyky Bychkiv.

This boarding school is the place for orphans, children of the only parents or poor parents. There are 23 children in the school and 100 of them are living there on permanent basis. There are also 53 teachers, out of which 21 are constantly living near the school in teacher's house. The school and its infrastructure is built in 1964 (45 years ago). For the school, wastewater treatment network based on mechanical treatment was built. After catastrophic floods in 1970, 1994, 1998, 2001 and 2008, treatment facilities were heavily damaged.

As a result of ineffective work of the wastewater treatment facilities, each year Tisza receives untreated waters, because they have direct discharge into Tisza. Just downstream of the discharge at the right bank of Tisza there is water in-take for Velyky Bychkiv and a little bit more downstream – the water in-take in Romania for water supply for Sigetu-Marmatseu and surrounding villages.



Picture 7. The old (not functioning wastewater facilities) in Velyky Bychkiv can be easily used as a scene for horror movies

The construction of the local wastewater facilities here is also important because the boarding school is social infrastructure which doesn't have enough funding itself. However, it has already constructed canalization network, which can be used.

Proposed solution

It is proposed the use the modern local wastewater treatment facilities with *biological* treatment.

The project has conducted the local tender for the wastewater treatment facilities. The winner of the tender became company "Canal Lux" (Uzhgorod, Ukraine). This company is the first one who applied Biotals (system of full deep treatment of wastewaters) In Ukraine. The wastewater facilities are produced according to the certified technology, developed in Check Republic. It has a large experience of work in Ukraine (more than 150 installations). The company gives warranty for 3 years and monthly service works. It is planned to conduct monitoring of water quality during each month of work of wastewater facilities to see the effect of the treatment. Besides, as a part of their promo action in the region, the company co-funds of around 5,000 USD into the facilities. The results will be shown in the final report on this component.

Besides, which is the most important, it is one the best modern cost-effective technologies for local wastewater treatment in Ukraine. So this way the project will promote best practices in Ukraine. It corresponds to the decree of the head of Zakarpattya Oblast Administration from 16th of August 2005 "*On Use of Modern Systems of Deep Treatment of Wastewaters*".

The capacity of planned wastewater treatment facilities (type Bioleader -10) is 10m³ / day or 3650 m³ per year.

It is worth of mentioning that taking into account the social value of the project the co-finding from the side of the subcontractor's company is 40,000 UAH (5000 USD). It makes such a decision also to popularize these wastewater treatment facilities in this part of the region.

Objective: to design and construct local wastewater treatment facilities for the boarding school in Velyky Bychkiv

Activities:

5.1 Preparatory works for installation of the wastewater treatment facilities (June-July 2009)

- Preparation of design documentation
- Works to prepare the place for installation (cleaning the canalization network of the boarding school, preparation of the place for installation, drainage way, outlet in the bank)

5.2 Installation of wastewater facilities (August 2009)

5.3 Commencement of wastewater facilities (the official opening of the new system is planned for the 1st of September – first day of school)

5.4 Workshop on the best practices in wastewater treatment, based on the used technology (September 2009)

5.5 Monitoring of work of the wastewater facilities: diagnostics of the equipment and active sediments analysis, chemical water quality analysis before and after the installation (September – December 2009, June-August 2010)

Output:

Local wastewater treatment facilities are built and effectively function

Benefits:

- Decrease of pollution load on Tisza and especially for the water in-takes located downstream
- Improvement of sanitary and safety conditions in the boarding school
- Demonstration of the best practices in biological wastewater treatment

3. REVISED Work Plan

Outputs and Activities	Month																		
	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	
1 Solid waste management																			
1.1 Review of the present waste management system		▶	▶																
1.2 Purchasing of containers for general waste and plastic			▶	▶	▶														
1.3 Purchasing of press installation and trainings				▶	▶														
1.4 Joint Ukrainian-Romanian environmental campaign "Two Banks – One Clean Tisza"						▶	▶						▶	▶					
1.5 Educational campaign on separate plastic collection					▶	▶	▶	▶				▶	▶	▶					
1.6 Selling of plastic									▶									▶	
1.7 Production of the TV-programme			▶	▶		▶	▶		▶			▶						▶	
2 Local Flood Risk Management																			
2.1 Hydrological and hydraulic investigations		▶	▶	▶	▶														
2.2 Flood hazard and flood risk maps development						▶	▶	▶											
2.3 Development and implementation of measures									▶	▶			▶	▶	▶	▶			
2.4 Public campaign towards flood risk and damage mitigation									▶	▶			▶	▶					
3 Revitalization of habitats																			
3.1 Physical cleaning of wooded residues from the riverbed			▶	▶	▶														
3.2 Development of the methodology and restoration of biotope			▶	▶	▶														
3.3 Introduction of invertebrates						▶													
3.4 Supervision of the riverbed restoration							▶							▶					
3.5 To study biodiversity of the lake, to create signs						▶	▶	▶											
3.6 To construct the wooden bridge, ecological path													▶	▶					
4 Re-opening of water gauging station																			
4.1 Purchasing of equipment and materials for construction works				▶	▶	▶	▶												
4.2 Calibration of the equipment and conduction of trainings								▶	▶										
4.3 Official re-opening of the station									▶										
5 Local wastewater facilities																			
5.1 Preparatory works			▶	▶															
5.2 Installation					▶														
5.3 Commencement						▶													
5.4 Workshop on the best practices						▶													
5.5 Monitoring of work							▶	▶	▶						▶	▶	▶		
Project management, monitoring and reporting *																			
Inception Period	▶	▶	1																
Establishment of project team	▶	2																	
Project management and coordination	▶	▶	▶	▶	▶	3	▶	▶	3	▶	▶	3	▶	▶	▶	3	▶	▶	3
Project supervision	▶	▶	4	▶	▶	▶	▶	▶	4	▶	▶	▶	▶	▶	▶	▶	▶	▶	4
Reporting			5			5			5			5			5				5
External implementation review **									6										6
Financial Audit																			7
Key																			
Ongoing activity	▶	* Minimum requirements indicated																	
Milestones	x	** Costs to be covered from UNDP support																	
Inception Workshop and Report	1																		
Project team established	2																		
Coordination meetings of partners	3																		
Establishment and meetings of the Project Supervisory Body (Steering Committee)	4																		
Quarterly Progress Reports and Final Report	5																		
Mid-term and Final Review	6																		
Financial Audit	7																		

4. REVISED LOGICAL FRAMEWORK MATRIX with indicators

Goal:	to demonstrate innovative and cost-effective solutions to the typical environmental problems faced in Upper Tisza floodplains with guide for their further replication				
Project Objective	Indicator	Baseline	Target	Sources of verification	Risks and Assumptions
To promote sustainable patterns of land and water management	<i>Waste management, separate plastic collection</i>	absent	Introduced and sustainably functions	Site visit to VB and BM	Close community involvement and desire to accept new practices
	<i>Flood protection from local stream</i>	absent	Studied and practically implemented (via construction work)	Site visit to VB	Obtaining of all needed permits for the flood mitigation construction
	<i>State of mountainous streams after wood cutting</i>	deteriorated	Restored and biologically stable	Site visit to VB and RO, work of Dilove State forest enterprise	Close cooperation with local forest managers and school association in RO
	<i>Presence of water gauging station in Kobyletska Polyana</i>	absent	Reconstructed and re-opened. Data are available for UA and RO sides	Site visit to VB, Zakarpatya Hydrometeorological Service reports on its network	Cofinancing from the side of Zakarpatya Hydromet, its including in the general network
	<i>Local Sewage water facilities and network in VB</i>	absent	Designed and constructed	Site visit to VB	Co-financing from the side of VB, time limits for construction works

Project Objective	Indicator	Baseline	Target	Sources of verification	Risks and Assumptions
Project Outputs					
Output 1 Improved communal waste management system functions	<i>State of Tisza floodplain</i>	Polluted with the garbage	Cleaned and kept cleaned	Site visit to VB and BM	Close community involvement and desire to follow waste collection rules
	<i>Containers and press purchased</i>	No	350 containers of different size have been bought for VB and 20 for BM, Press for plastic was bought and installed	Site visit to VB	VB provision of man/power to operate the press and separate plastic collection
	<i>Plastic collected and sold</i>	no	Separate plastic collection system functions	Volume of sold plastic	Willingness of the third parties to buy pressed plastic
Output 2 Management plan of streams elaborated and implemented	<i>Flow and retention capacity of the streams</i>	the flow capacity is decreased	Stream flow capacity increased in 1,5 times	Hydrological and hydraulic data	Need to be co-ordinated with the General Construction scheme of VB Garbage pollution of the cleaned streams
	<i>Flood risk and flood hazard maps</i>	No	Developed	Site visit to VB	Presence of maps with scale 10:000
	<i>Construction works</i>	No	1200 m of the Duhnovicha stream was cleaned; A pond for floodwaters of size 13 x 45 m was created	Site visits to the stream	Need to be agreed with many organizations
	<i>Regime of work of pumping stations</i>	no	Developed and practically tested for different scenarios of floods	Report on pumping station operation during the flood	Low capacity of pumping stations
	<i>Public awareness raised on preparedness to floods</i>	Low	High, action plans in times are developed	Brochures	Low involvement into the project

Project Objective	Indicator	Baseline	Target	Sources of verification	Risks and Assumptions
Output 3 Mountainous stream restored (UA) and ecological path created (RO)	<i>Water quality in the stream</i>	Bad	Good for biota	Chemical analysis	Unsustainable forest management practices in future at the same spot
	<i>Number of invertebrates</i>	0	In number corresponding to natural conditions	Hydrological sampling	
	<i>Cascades</i>	no	At least 3 cascades built	Site visit to the stream	
	<i>Bridge to the island</i>	no	built	Site visit to the lake	Too many tourists will lead to destruction of the nature
	<i>Posters and signs</i>	no	put	Site visit to the lake	
Output 4 Water gauging station is re-opened	<i>Presence of water gauging station</i>	no	Operational on regular basis	Site visit	All needed agreements for the new station are obtained
	<i>Monitoring data from Dilove</i>	no	Regularly sent to Zakarpattya Hydromet and RO counterparts	Zakarpattya Hydromet data	
Output 5 Sewage water treatment facilities and network are constructed	<i>Presence of sewage water facilities</i>	No	The wastewater treatment facilities of total capacity of 10m ³ /day has been installed	Reports of VB village council	Maintenance costs
	<i>Water quality of wastewater after treatment</i>	Ammonium-N – 25 Total-N – 35,0 Ortho-phosphate-P – 12,0 Total-P – 15,0 BOD ₅ - 250 COD _{Mn} – 120 COD _{Cr} – 160 (data for 2007, in mg/l)	Ammonium-N – 2,0 Total-N – 15,0 Ortho-phosphate-P – 3,0 Total-P – 3,5 BOD ₅ - 10 COD _{Mn} – 15 COD _{Cr} – 30	Chemical water quality analysis	Rapid grow of the number of children in the boarding school

5. FINANCIAL MANAGEMENT AND CO-FINANCING

Outputs and activities	Expenditure account	Month						TOTAL
		Apr-June	July-Sept	Oct-Dec	Jan-Mar	Apr-June	July-Sept	
1 Solid waste management								
1.1 Review of the present waste management system	external experts	1000						1000
1.2 Purchasing of containers for general waste and plastic	Materials /equipment		16000					16000
1.3 Purchasing of press installation and trainings	Equipment		6000					6000
1.4 Joint Ukrainian-Romanian environmental campaign "Two Banks – One Clean Tisza"	Materials		2000			3000		5000
1.5 Educational campaign on separate plastic collection	Materials and printing		500	1000		1500		3000
1.6 Selling of plastic								0
1.7 Production of the TV-programme	Service contract		500				500	1000
Subtotal 1		1000	25000	1000	0	4500	0	31500
2 Local Flood Risk Management								
2.1 Hydrological and hydraulic investigations	External experts	1000			4000			5000
2.2 Flood hazard and flood risk maps development	External experts				3000			3000
2.3 Development and implementation of measures	Service contract				3000	5000	5000	13000
2.4 Public campaign towards flood risk and damage mitigation	External experts					2000		2000
Subtotal 2		1000	0	0	10000	7000	5000	23000
3 Revitalization of habitats								
3.1 Physical cleaning of wooded residues from the riverbed	Materials		3000					3000
3.2 Development of the methodology and restoration of biotope	Service contract		3500					3500
3.3 Introduction of invertebrates	External experts					3500		3500
3.4 Supervision of the riverbed restoration	External experts							0
3.5 To study biodiversity of the lake, to create signs	External experts			1500				1500
3.6 To construct the wooden bridge, ecological path	Materials				2000			2000
Subtotal 3		0	6500	1500	2000	3500	0	13500
4 Re-opening of water gauging station								
4.1 Purchasing of equipment and materials for construction works	Equipment		3000					3000
4.2 Calibration of the equipment and conduction of trainings	Service contract							0
4.3 Official re-opening of the station	External experts							0
Subtotal 4		0	3000	0	0	0	0	3000
5 Local wastewater facilities								
5.1 Preparatory works	Service contract	500						500
5.2 Installation	Service contract		10000					10000
5.3 Commencement	Service contract							0
5.4 Workshop on the best practices			500					500
5.5 Monitoring of work				1000				1000
Subtotal 5		500	10500	1000	0	0	0	12000
Project management, monitoring and reporting								
Management Outputs 1-5	Project staff					4000	5600	9600
Workshops	Hospitality, printing costs	1500	300	300	300	300	1500	4200
Local travel costs	Travel	500	500	500	500	500	500	3000
International travel (4 Tisza group meetings)	Travel	800			800	800	800	3200
Audit	Audit			1000			500	1500
Office supplies, printing	Office supply, printing	100	100	100	100	100	100	600
Communication costs	Communications	150	150	150	150	150	150	900
Subtotal PM		3050	1050	2050	1850	5850	9150	23000
TOTAL		5550	46050	5550	13850	20850	14150	106000
Expenditure accounts								Amount (USD)
Project Staff	Project staff and experts (external or those of partners) contracted on project substance							9600
Travel & workshops	Local, international travel tickets, fuel, DSA, meeting rooms etc.							10400
Service contracts	Contracts with companies on different types of services							30500
Materials / equipment	Purchase of equipment required to undertake demonstration project							52500
Communication	Mobile and land telephone charges, postage and courier							900
Audit costs	Financial audit costs							1500
Printing costs	Printing, copying, translation							600

Co-financing

Outputs and activities	Type of costs *	Partner / Stakeholder									
		PP1	PP2	PP4	PP5	PP6	PP7	PP8	PP9	PP10	TOTAL
1 Solid waste management											
1.3 Purchasing of press installation and trainings	repairing of the building salary of press operator	3000									3000
1.5 Educational campaign on separate plastic collection	educational materials, organizational support	1000	1000								2000
Subtotal 1		4000	1000	0	0	0	0	0	0	0	5000
2 Local Flood Risk Management											
2.1 Hydrological and hydraulic investigations	Expertise							1500			1500
2.3 Implementation of construction measures	Co-financing of construction	8000									8000
2.3 Implementation of construction measures	Equipment				2000						2000
Subtotal 2		8000	0	0	2000	0	0	1500	0	0	11500
3 Revitalization of habitats											
3.1 Physical cleaning of wooded residues from the riverbed	Equipment								1500		1500
3.3 Introduction of invertebrates	Sampling						5000				
3.4 Supervision of the riverbed restoration	Expertise and transport						8000				8000
3.6 To construct the wooden bridge, ecological path	assessment			1200							1200
Subtotal 3		0	0	1200	0	0	13000	0	1500	0	10700
4 Re-opening of water gauging station											
4.1 Purchasing of equipment and materials for construction works	Equipment					5000					5000
4.2 Calibration of the equipment and conduction of trainings	Expertise					1000					1000
4.3 Official re-opening of the station	Operational costs					3000					3000
Subtotal 4		0	0	0	0	9000	0	0	0	0	9000
5 Local wastewater facilities											
5.1 Preparatory works	Construction works									5000	5000
Subtotal 5		0	0	0	0	0	0	0	0	5000	5000
Project management, monitoring and reporting											
Output 1-5	Office costs					3600					3600
Subtotal PM		0	0	0	0	3600	0	0	0	0	3600
TOTAL		12000	1000	1200	2000	12600	13000	1500	1500	5000	44800

6. REPORTING AND MONITORING

Following the requirements of ICPDR and UNDP GEF the following *administrative reports* will be prepared.

- **Inception report:** The project will hold an inception workshop to further present, discuss and refine the work programme involving key stakeholders of the project. The results of this workshop, together with any other issues, will be presented to the ICPDR in an ‘Inception Report’.
- **Quarterly Reports:** Brief progress reports giving details of the work undertaken in the last quarter, planned for the next quarter, problems encountered (and recommended solutions), meetings and a financial summary should be submitted every 3 months. These reports will highlight progress with reference to the project logframe. After 9 month an Interim Financial Report will be delivered.
- **Draft and Final Financial Reports:** The Final Financial Report shall contain eligible expenditures and payments received.
- **Independent Mid-term and Final Evaluation:** A review of the progress of the project will be made after 9 months. This will closely examine the activities undertaken, the achieved (or planned results) and make recommendations for any mid-term corrections needed to the work programme. A final evaluation will be undertaken following completion of the project and will examine the overall impact of the project against the project logical framework.

The following *Technical reports* with final description of main activities by each component will be prepared: The technical reports should present a clear account of the activities undertaken, outputs achieved, outcomes expected, lessons learnt, opportunities for replication etc.

- Report on strategy for solid waste management system and separate plastic utilization and its practical results, achieved in Velyky Bychkiv and Bocicioiu Mare (July 2010)
- Report with Local Flood Risk Management Plan and flood risk and flood hazard maps and practical construction actions taken to mitigate the floods (August 2010)
- Report on methodology of mountains streams restoration after forest cutting activities and its practical results (August 2010)
- Report on environmental path establishment around the lake and revitalization of the lake in Romania (May 2010)
- Report on re-opening of the water gauging station and state of affairs with monitoring data sharing obtained at this station.

Besides, as far as each component has practical (construction) activities, the monitoring of results can be conducted by site visits to the relevant places of the project implementation and other indicators of monitoring stated in the Revised Logical Framework.

All outputs of the project will also be presented in the special TV-programme.

- **Workshops and meetings:** A representative of the demonstration project will participate at the ICPDR's Tisza Group meeting held jointly with the UNDP/GEF Tisza workshops to present progress and to give examples of how the demonstration project can best assist the river basin management process. In addition, two regional stakeholder meetings will be organised by UNDP within the Tisza River Basin and these meetings will serve as important opportunities to present the activities and results of the demonstration projects. These stakeholder workshops will coincide with the mid-point and the end of the demonstration projects work and will provide input to the mid and final evaluation of the projects.

Financial monitoring will be done in the form of independent audit. The audit is planned in the end of the lifetime of the project (September 2010).

7. IMPLEMENTATION ARRANGEMENTS

7.1 Roles and responsibilities of project staff, project partners and key stakeholders

The project team will include

- Vasyl Manivchuk, Director of the project, Zakarpattya Oblast branch of All-Ukrainian Ecological league - generally responsible for the project implementation
- Olena Marushevska, his Deputy, Zakarpattya Oblast branch of All-Ukrainian Ecological league – responsible for reporting and contacts with UNDP-GEF
- For each output there is a person assigned, responsible for timely delivery of the output

Outputs	Responsible	Organization
1. Solid waste management system for VB and BM improved	Olena Marushevska	Zakarpattya Oblast branch of All-Ukrainian Ecological league
2. Local flood risk management plan is developed and implemented	Eduard Osiysky	Zakarpattya Oblast Water Management Board

3. Habitat of mountainous creek (Ukraine) is restored and ecological path around the lake in Romania is established	Olena Letitska	Institute of Hydrobiology of National Academy of Sciences
4. Water gauging station in Dilove village, Tisza river is re-opened	Vasyl Manivchuk	Zakarpattya Oblast branch of All-Ukrainian Ecological league
5. Waste water facilities for district of Velyky Bychkiv are designed and constructed	Eduard Osiysky	Zakarpattya Oblast Water Management Board

The Project team will closely cooperate with Alexei Iarochevitch, National expert in Ukraine and relevant national expert in Romania and technical advisor Mr. Kemaly Aliev as well as with other demonstration UNDP-GEF projects and on-going projects in the region, like INTERREG.

7.2 Project supervisory bodies

During the Inception workshop (11th of June), the project supervisory board was established. It includes:

1. Odarka Zlenko / Yosyp Bozhuk, Head of Velyky Bychkiv village
2. Livio Lazarchuk / Vasyl Grynyuk, Head of Bocicoui Mare
3. Kemaliy Aliev, technical advisor
4. Alexei Iarochevitch, national expert of ICPDR
5. Vasyl Manivchuk, project director
6. Olena Marushevska, deputy project director
7. Yury Tkachuk, Rakhiv Rayon Administration
8. Yury Malyarchuk, Association of the schools of villages Bocicioiu-Mare, tisza, Cricinetsi and Lunka la Tisza
9. Yosypchuk Mykhaylo – Director of the Boarding School
10. LutsakYosyp – Seft-management of Velyky Bychkiv Council

If needed, project output leaders and other partners will be invited for the Steering Committee meetings for reporting. The committee will meet at co-ordination meetings according to the revised working plan. The location of the meetings will be in VB due to visa constrains to make it in BC.

Roles and responsibilities of partners and stakeholders

Name: Role in the project:	Velyky Bychkiv village council (PP1) Main beneficiary and partner of the project in Ukraine <ul style="list-style-type: none"> • Output 1 (waste) - support in environmental raising campaign, provision of the space and manpower for the stable press operation • Output 2 (flood) - co-financing of the construction measures on the stream, support in public hearings arrangement
Name: Role in the project:	Bocicoui Mare community (PP2) <ul style="list-style-type: none"> • Output 1 (waste) - support in environmental raising campaign, provision of the space and manpower for the improved waste management system operation • Output 3 (lake) – support in organization of ecological path, co-financing of bridge construction

Name: Role in the project:	Rakhiv Rayon State Administration (PP3) <ul style="list-style-type: none"> For all outputs - including the project recommendation in local development policy within Rakhiv rayon, support in project replication for other areas of the rayon
Name: Role in the project:	Association of schools of commune of villages Bocicoiu Mare, Tisa, Crăciunești and Lunca la Tisa (PP4) <ul style="list-style-type: none"> Output 3 (stream restoration) – co-ordinator of this output achievement at RO side.
Name: Role in the project:	Tyachiv rayon water management unit of Zakarpattya Water Management Board (PP5) <ul style="list-style-type: none"> Output 2 (flood) - provision of all necessary data and conduction of the construction works for flood mitigation. Its in-kind contribution is staff, machines, equipment
Name: Role in the project:	Zakarpattya Center for Hydrometeorology (PP6) <ul style="list-style-type: none"> Output 4 (water gauging station) – providing of automatic station and other equipment and covering of its operational costs (staff, communication costs) and will provide received data at national and international levels.
Name: Role in the project:	Institute of Hydrobiology National Academy of Science of Ukraine (PP7) <ul style="list-style-type: none"> Output 3 (stream restoration) – co-ordinator of this output achievement. It will provide expertise and sampling as well as monitoring after the end of the project as in-kind contribution.
Name: Role in the project:	Kyiv National University of Taras Shevchenko, Geographic Faculty (PP8) <ul style="list-style-type: none"> Output 2 (flood) – calculation of hydraulic characteristics of the streams, preparation of different flood scenarios.
Name: Role in the project:	Dilove State Forest Enterprise (PP9) <ul style="list-style-type: none"> Output 3 (stream restoration) – practical implementation of the stream renaturalization as on-job trainings in the new methodology.
Name: Role in the project:	Private enterprise “Canal Lux” (Uzhgorod, Ukraine) (PP10) <ul style="list-style-type: none"> Output 5 (local wastewater treatment facilities) – cofinancing of the construction of the facilities

8. Annex 1: MINUTES OF MEETING of Inception workshop

Velyky Bychkiv, Ukraine

11th June 2009

Participants:

1. Aliev Kemaly – Technical advisor
 2. Bartkova Eleonora – Project Manager of demo project “Making Space for Bodrog River”
 3. Bozhuk Ivan – waste management company “Shuravi”
 4. Bozhuk Yosyp – Deputy Head of the village council in Velyky Bychkiv;
 5. Whalley Peter – Project Director of MSP project
 6. Grynyuk Vasyl – Deputy Head of Bocicou Mare, Romania;
 7. Dryashkaba Vasyl – Head of communal enterprise, Velyky Bychkiv village council
 8. Zlenko Odarka - Head of village council in Velyky Bychkiv, Ukraine;
 9. Yosypchuk Mykhaylo – Director of the Boarding School
 10. Letitska Olena – Institute of Hydrobiology of National Academy of Sciences
 11. Malyarchuk Yury – Association of the schools of villages Bocicou-Mare, tizza, Cricinetsi and Lunka la Tizza
 12. Manivchuk Vasyl – Project Director;
 13. Marushevska Olena – Project Manager;
 14. Onischuk Vasyl - Kyiv National University, geographical department;
 15. Osiysky Eduard – Head of the department of complex water use, Zakarpattya water management board;
 16. Pukman Vasyl - Director of Dilove state forest enterprise, Velyky Bychkiv Forestry.
 17. Tothova Klara – UNDP GEF Bratislava
 18. Tkachuk Yury – Deputy head of Rakhiv Rayon State Administration
 19. Helman Diana – Head of the Tisza Working group of ICPDR
 20. Shpilka Vasyl – Head of Velyky Bychkiv operational unit, Tyachiv Department of Zakarpattya Water Management Board;
 21. LutsakYosyp – Seft-management of Velyky Bychkiv Council
 22. Shpytyak Vasyl - Tyachiv Department of Zakarpattya Water Management Board;
 23. Tkachuk Volodymyr – Director of waste management company “Shuravi”
 24. Usov Olexandr - Institute of Hydrobiology of National Academy of Sciences
 25. Yagnyuk Borys – Teacher of the boarding school
- (scanned list of participants with signatures in Ukrainian is attached)

Agenda:

1. Official opening of the workshop

Welcome and project expectations. Odarka Zlenko, Head of Vekyly Bychkiv

Mrs. Zlenko welcomed the participants and assured that VB village council is fully aware of not only benefits, provided by the project, but also their responsibility towards sustainability of the results and assured that the community is interested in all components of the project and will support project team as much as possible during its implementation.

Welcome and project expectations. Yury Tkachuk, Deputy Head of Rakhiv Rayon Administration

Mr. Tkachuk stressed that the project deals with the typical project of Rakhiv region and for the Administration it is very important to have the results of the project widely disseminated around the communities in this rayon and promised their support on this.

Welcome and project expectations. *Vasyl Grynyuk, Deputy Head of Bococoua Mare*

Mr. Grynyuk stressed that we can have a clean Tisza only in case of joint efforts from Ukrainian and Romanian side and confirmed their participation in the project.

Project background. *Peter Whalley, Project Director of UNDP MSP Tisza project*

Mr. Whalley explained the role of MSP Tisza project and activities of ICPDR and the main expectations from the project from the side of project leadership, which is sustainability and community involvement, beneficial for Tisza restoration.



Photo of the Inception report

2. Presentations

Project background and ToR, *Vasyl Manivchuk*

- Component 1: Improvement of Solid Waste Management system in Velyky Bychkiv and Bocioua Mare, *Olena Marushevska*

Comments: The village council have already obtained the sample of the garbage bins to be bought in frame of the project, it also have allocated the proper premises for the press for plastic, so they have fulfilled all the requirements asked from the side of the project. The Ukrainian-Romanian joint campaign on clean Tisza is planned for September 2009 (not July 2009 as stated in Inception report), because the children are on vacations.

- Component 2: Development and Implementation of Local Flood Risk management Plan, *Vasyl Oniszhuk*

Comments: Mrs. Zlenko once again asked the project help in investigation not only flooding issue but also suggesting the solution for drinking water supply in this region. Although it is out of the scope of work, the project promised to find a proper solution for this.

- Component 3. Restoration of the mountainous creek after forest cutting activities and establishment of ecological path around the lake, *Olena Letitska*
- Component 4. Re-opening of water gauging station in Kobyletska Polyana, *Vasyl Manivchuk*

- *Component 5.* Design and construction of local wastewater treatment facilities for boarding school in Velyky Bychkiv, *Eduard Osiyskiy*

For the details, please see presentations.

3. Establishment of the project Steering Committee

The project meeting decided to establish Steering Committee to approve the project activities in following composition:

11. Odarka Zlenko / Yosyp Bozhuk, Head of Velyky Bychkiv village
12. Livio Lazarchuk / Vasyl Grynyuk, Head of Bocicoui Mare
13. Kemaliy Aliev, technical advisor
14. Alexei Iarochévitch, national expert of ICPDR
15. Vasyl Manivchuk, project director
16. Olena Marushevska, deputy project director
17. Yury Tkachuk, Rakhiv Rayon Administration
18. Yury Malyarchuk, Association of the schools of villages Bocicoiu-Mare, tizza, Cricinetsi and Lunka la Tizza
19. Yosypchuk Mykhaylo – Director of the Boarding School
20. Lutsak Yosyp – Seft-management of Velyky Bychkiv Council

4. Site visits

- To the premises for the press installment (Component 1): the premises are very good and meet all the requirements of the project. So the project assures that the press will be delivered asap.
- To old wastewater treatment facilities of the boarding school (Component 5): the Director of the school showed the old installations and planned location of the new wastewater treatment facilities to be built in frame of the project
- To sluice with Tisza river and Dukhovicha stream (Component 2): the project experts together with the village representatives showed the flood marks and the area regularly flooded and explained the nature of the problems. They also confirm their input and interest in riverbed cleaning and pond establishment.
- To the confluence of the Chorna and Bila Tisza to see where Tisza starts.

Conclusions:

1. The Inception Report and working plan was presented to the stakeholders and they agreed with the proposed actions. Belyky Bychkiv and Bocociua Mare village council and Rakhiv Rayon Administration confirmed their interest in implementation of all the components.
2. The Steering Committee was established in the composition stated above.
3. On the request of the Rakhiv Administration it was decided to ensure wider participation of other communities in the project meetings, because the project deals with the typical issues for all the communities.

4.For Component 1 (soled waste management) Velyky Bychkiv village council has implemented all their obligations: finding the supplier of containers and providing a proper place for press installation.

5.For Component 2 on flood management, it was agreed that the project will suggest the solution for drinking water supply in this region.