OPERATIONALISATION STAKEHOLDER WORKSHOP

06.11.2018, PARMA, ITALY

LOCATION: PO RIVER DISTRICT BASIN AUTHORITY, PARMA (ITALY)

ARPAE AREA IDROLOGIA - PP 9 (HOST)

"BEST MANAGEMENT PRACTICES FOR WATER PROTECTION IN PO RIVER BASIN CONSIDERING FLOODS, DROUGHTS, CLIMATE CHANGE AND LAND USE CHANGE IMPACTS: *Stakeholders involvement on first results of the Interreg Proline-CE Project* »

1. Invitation

INVITO

Progetto INTERREG Proline-CE

Secondo Incontro Nazionale con gli *stakeholders*

6 Novembre 2018

Ore 9,00

Sala comitato 2° piano

Arpae Area Idrografia e Idrologia

Strada Giuseppe Garibaldi, 75 - PARMA

La Fondazione CMCC, Centro Euro-Mediterraneo sui Cambiamenti Climatici, e ARPAE Emilia Romagna hanno il piacere di invitarLa al secondo workshop nazionale del progetto INTERREG–CE PROLINE-CE.

Lo scopo di tale progetto è lo sviluppo di linee guida transnazionali per la protezione delle risorse idriche in particolare ai fini idropotabili. Tale obiettivo si ritiene possa essere perseguito tramite lo sviluppo di pratiche appropriate e sostenibili di gestione e uso del suolo in grado, al contempo, di ridurre i potenziali rischi connessi a fenomeni siccitosi e alluvionali che potrebbero incrementare, in intensità e frequenza, per effetto dei cambiamenti climatici.

In particolare, il secondo workshop nazionale ha l'obiettivo di:

- ✓ Presentare le *Best Management Practices* individuate per il caso pilota del Bacino del Fiume Po dai partner nazionali del Progetto
- ✓ Raccogliere le riflessioni degli *stakeholders* sulle azioni individuate, la loro efficacia o rilevanza sull'area
- ✓ Valutare, sulla base delle esperienze degli *stakeholders*, le possibilità di rendere operative e finanziabili le azioni proposte

Sperando di poter contare sulla Sua presenza

Cordiali Saluti

Il Comitato Organizzatore

Per registrarsi all'evento, La preghiamo di inviare il modulo allegato a:
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Per maggiori informazioni sul Progetto:
http://www.interreg-central.eu/Content.Node/PROLINE-CE.html

2. Minutes

2.1. Presentation of pilot action outcomes

In Po river basin (Pilot Action PA3.1 in Proline-CE Project) the main BMPs identified, and discussed during our national stakeholder workshop, are three:

- The Drought Steering Committee and DEWS

  DESCRIPTION: the Drought Steering Committee is a Multisectoral partnership - supported by Drought Early Warning System (DEWS)- that consists in a forum of major water users in Po River basin, initiated and presided by the Po River Basin Authority (P-RBA). Since 2016 a permanent network of "Observatories on water uses" has been established among all public and private stakeholders of national relevance. According to this network the Po Drought Steering Committee has the new role of Permanent Observatory on Water Uses in the Po River Basin District.

  LIMITATIONS: lack of imposition power (such a low could have); water scarcity emergency threshold planned not still implemented; high prediction uncertainties; procedures and institutional tools (Land Reclamation Boards modelling); cost benefits analysis implementation in the decision support tool; needs of completing the monitoring system for uptakes.

  CHALLENGES: practicable, measurable and effective overcoming of Institutional fragmentation through an Authority with more decision-making power and more structured decision processes based on flow charts. web services for water scarcity information. Business continuity guarantee to maintain the operational system on water resources management (DEWS) in the Po River Basin District to support planning and integrated management processes.

- The Flood Forecast Center for the Po River and FEWS

  DESCRIPTION: the Flood Forecast Center for the Po River is in charge to the Interregional Agency for the Po River and is supported by the Hydrology Unit of Arpae. The Center provides flood forecasts monitoring and evaluation supported by the Flood Early Warning System (FEWS). Through FEWS it is possible to manage observed data (in situ and remote sensed) and forecasts, obtained from meteorological-hydrological- hydraulic simulation in order to early detect floods, their occurrence, entity and characteristics. The Flood Forecast Center supports the Command and Control Unit within the Civil Protection System.

  LIMITATIONS: During extreme events it could be very difficult to supply information and to link all the stakeholders and actors in time to undertake flood mitigation actions; high prediction uncertainties; the actual consistency of the monitoring and forecasting network may not be fully representative of the extension, heterogeneity and complexity of the basin and of the river network.

CHALLENGES: Managing the whole flood disaster cycle through a practicable, measurable and effective guide to support decisions, procedures, processes and actions.

Business continuity guarantee to maintain the operational system on flood management (FEWS) in Po river basin to support planning and integrated management processes.

- Analysis of the impacts of climate changes on drinking water resources

  DESCRIPTION: it is an attempt to perform an analysis aimed to explicitly assess the potential impacts of climate and land use changes on freshwater resources providing a decision support tool for stakeholders. To this purpose, climate projections and assessments on land use changes drive physically based models estimating quantity and quality of water resources. As test case, a small river basin in Emilia Romagna, Taro River, is used for a prototypal framework.

  LIMITATIONS: uncertainties have to be carefully evaluated and made clear to stakeholders; it requires the adoption of probabilistic approaches for all the different stages of modelling chain.

  CHALLENGES: future evolution of weather forcing under the effect of climate changes and associated feedbacks (f.e., in part, land use changes) are currently characterized by high uncertainties and low perception among all the stakeholders.

2.2. Presentation of measures and funding systems for supporting ecosystem services

Ecosystem services are the conditions and processes through which natural ecosystems (sustainable land uses) sustain and fulfil human life. Because PROLINE-CE project mainly focus on drinking water protection and flood/drought mitigation, it has been considered a subset of ecosystem services including water supply and water damage mitigation, generally named hydrological services. In deliverable T3.1.1 “Analytic report about potential public services of sustainable land use”, for each project cluster (forest ecosystem in mountainous areas, agricultural used ecosystems and riparian strips), the hydrological services generated for the improvement of water supply, water quality damage mitigation and water flood damage mitigation have been described. BMPs which provide significant benefit to each of those services have been detailed.

PROLINE-CE project describes the provision of hydrological services under the presumption of the application of best management practices presented above and of the whole BMP Catalogue proposed within the project, so to speak under conditions of sustainable land use.

For this reason, BMPs which provide significant benefit and increase to each of the described hydrological services have been detailed.

Main activities and results of T3.1.2 “Catalogue of measures and possibilities for funding ecosystem services” have been presented. Main typologies of funding opportunities for ecosystem services can be summarized as follow:

Public schemes or government-financed PES, which involve a government agency, or another public institution providing direct payments and subsidies to landowners to steward and manage their land in ways that will generate or enhance ecosystem services including user fees, land purchase and granting of rights to use land resources as well as fiscal mechanisms based on taxes breaks and subsidies (e.g. CAP).

Private schemes or User-driven PES, which are self-organized private deals in which ecosystem services users or beneficiaries (i.e. water utilities, companies, firms) directly pay landowner or other parties to conserve, restore and deliver the services.

Trading schemes and offsets, which occur where compensation for the provision of an environmental service comes from funds generated in markets in which environmental permits, quotas or other rights can be exchanged. Parties facing regulatory obligations compensate other parties for activities that maintain or enhance comparable ecosystem services or goods in exchange for a standardized credit or offset that satisfies their mitigation requirements. Examples include water quality trading and wetlands mitigation banking.

Most commonly applied measures and schemes applied across CE are those public or government based. The primary sources of public incentives for ESs management are represented by EU funds, in some cases, complemented by national and regional financing mechanisms also incorporating private sector funding. The EU Agricultural Fund for the Rural Development (EAFRD) featured prominently across many of the analysed national experience: Agri-env-climate payments, Natura2000 and WFD payments and investments in forest areas represented the most commonly used type of PES schemes. Others EU funds commonly used including the EU Cohesion Fund, the Life/Life+ Programme, the EU Regional Development Fund (ERDF) and H2020 and Interreg funds for research and innovation.

In Italy, the National Payment System for Ecosystem and Environmental Services (PSEA) has been established but not yet fully implemented.

Moreover, the River Basin District Management Plans derived from the Water Framework Directive 200/60/EC give the opportunity for integration of specific measures and actions on different scales, sectors and aspects while specific coverage of costs are to be found in funded Plans.

Territorial Scope Integrated Water Supply Service Plans can carry out specific measure to reduce the environmental impact of water service (water abstraction, distribution, sewage, treatment, wastewater disposal and releases) and to protect water supply resources. They may include the above mentioned funding mechanisms, as also incomes from water service tariffs and other private funds.

According to PROLINE-CE project only the implementation of Best Management Practices which reach beyond the legally defined land use and water management regime that is beyond the level of the national/regional legal frame provide the possibility to apply PES schemes.

2.3. Carousel discussion

In order to get into a constructive dialogue and get feedbacks from the stakeholders, during the second part of the workshop the carousel discussion has been arranged following the indications of the so-called world café method.

In details, three thematic tables, one for each proposed BMP, have been set in three different rooms. The workshop participants have been divided in three groups of five-six people and two project leaders coordinated each working table.

Each thematic table was referred to one of the proposed BMP and the stakeholders were asked to discuss about the following main topics:

- BMP effectiveness;

- BMP implementation;

- Criticality and improvements.

Each group took place in each thematic table for 30 minutes; in this way, all the participants have been allowed giving their contribution and feedbacks on each BMP discussion. At the end of the working group activities, each table coordinator exposed to all participants the main outputs of the discussion referred to each BMP.

2.3.1. The Drought Steering Committee and DEWS (Drought Early Warning System)

In this case, the proposed BMP is the Drought Steering Committee and DEWS (Drought Early Warning System) for the Po River. DEWS was implemented in 2010 and, since then, it has been used to manage drought crisis in the Po river districts. The main outputs of the discussion highlighted that this practice is recognized as efficient and well accepted among the involved stakeholders.

On the other hand, some weak points, criticalities and suggestions for improvements have been pointed out.

First of all, stakeholders recognized the need of bringing together, on the same platform, all the actors involved in the management of water resources in the Po river districts in order to consider and balance all the different uses in a coherent way. In the platform, in fact, just the use of water for irrigation is included. Stakeholders proposed to include also the water for drinking purpose as objective of the Drought Steering Committee. Drinking water authorities and suppliers are already quite autonomous and well prepared to cope with drought emergencies and thus would bring good practices and procedure to possibly improve the capabilities of the Drought Steering Committee.

Stakeholders expressed the need for a higher spatial resolution. Working at the Po river basin scale the Drought Steering Committee sometimes miss to capture local but important criticalities, for instance in small rivers and lakes in rural and mountains areas (e.g. Apennines). Accordingly, they suggest implementing additional technical and institutional activities to monitor drought indicators at the local scales and to integrate them into the Drought Steering Committee and DEWS.

Stakeholders also suggested exploiting the potential of digitalization and Information Technologies to improve the connection and interoperability between different regional information and early warning systems. In this way would be possible, first of all to map all available supply sources and then to plan mixed-systems able, when needed, to use both surface and groundwater water and interconnected supply sources.

Drawing from this considerations, stakeholders also suggested to exploit as alternative water sources and storage the reservoirs located in mountainous regions which in the past where used for hydropower production and now are going to be dismissed. Some kind of compensation or payment for ecosystem services should be introduced in order to pay small landowners and farmers around the reservoirs to maintain ecosystem services able to sustain good water conditions.

Another relevant aspect that, according to stakeholders, should be considered in the platform is the inclusion of a modelling framework for long term projections in order to take into account the impact of climate change also in the planning of strategic investments and interventions. At the same time, stakeholders also asked for tools for a better assessment and management of accidental pollution events. It could be accomplished through further implementation in the operational DEW platform of water quality modelling and early warning system for acute pollution.

The assessment of economic impact of drought results of particular interest for some stakeholders. Including such kind of consideration within the platform would allow to improve the management of drought also from an economic point of view allowing a prioritization of management actions and to identify most cost-effect measures to implement (e.g. the use of water tanks to ensure water to small villages during the crisis rather than implement the water infrastructures).

Finally, some stakeholders propose to use the platform to collect and exchange, among the involved actors good practices and experiences for drought management already implemented.

2.3.2. The Flood Forecast Center for the Po River and FEWS (Flood Early Warning System)

In the flood risk management cycle, the following gaps have been identified:

- impacts of floods on environment, including water quality and drinking water supply system, is not yet fully considered;
- not all actors and tools are fully integrated yet.

In this case, the proposed BMP is the Flood Forecast Center for the Po River and FEWS (Flood Early Warning System).

The practice is already implemented. FEWS system is operational since 2010 and the Flood Forecast Center since 2013, so 4-7 years of experience are available. Actual available tools, processes, products, results and expertise derive from this multi-year managing.

The main outputs of the discussion highlight that this practice is relevant and well accepted among the stakeholders.

The stakeholder recognized the institutional responsibility and competence of the Flood Forecast Center, as the high computational level of the FEWS platform as flood alert system.

On the other hand, they revealed a number of weak points and expressed suggestions for making this practice, especially the platform and its derived products, suitable also for applications related to environmental protection.

First of all, a focus was given on the importance of the evaluation and prevention of flood impacts on the drinking water quality and quantity and on the management of supply systems.

Stakeholders expressed the need for a higher spatial resolution in the modelling analysis, concerning flood impacts deriving not only from the Po river main channel, but also from smaller rivers within the District.

For this issue the proposed BMP may be the starting point for new technical and institutional activities defined to meet focus on small scales and local requests.

About small rivers, affected by short concentration times, stakeholders also put in evidence the opportunity to take benefit from warning approaches simpler than complete hydrologic modelling, as for example statistical methods giving probability prediction of thresholds exceeding.

Standing the need of higher resolution information, for what concerns drinking waters extracted from bank filtration and coarse gravel deposits, it may also be very useful to receive information not only about flood, but also about heavy rains (intensity, amount, duration, etc.) and runoff which may have a direct impact on turbidity and on quality of high permeability aquifers and subsequently on water extraction management.

Going on in discussion, in all cases a need was expressed for longer warning time (now it is 36 h), more than 48 h before the flood occurs, in order to have more preparation time for action.

Furthermore, the communication of prediction uncertainty is considered an important issue among the potential users, because this gives the opportunity for a better understanding of the forecasts and a better assessment of their effects, so becoming one of the main issue for the BMP operability.

Stakeholders proposed detailed mapping and planning of areas prone to be impacted by the flood, especially of most vulnerable elements in terms of both drinking water resources and potential sources of pollution (such as areas of storage and deposit of contaminants).

The identification of the drinking water sources results relevant in the whole catchment for the assessment of water turbidity processes that can occur not only due to floods but also during heavy rainfall and flood events.

At the same time, mapping the potential source of pollutants is required in the whole catchment for the evaluation of the potential impact in terms of water quality due to runoff and overland flow process, not only floods.

In this contest, an adequate territorial and land use planning results useful for protecting water quality and reducing the risk of potential contamination.

During the dialogue, stakeholders asked for tools for a better managing of pollutants dynamics; this may be accomplished through further implementation in the operational FEWS platform of water quality modelling.

Stakeholders consider also the type and the effectiveness of the water treatment plans, whose operability is fundamental to ensure high quality drinking water to the aqueduct and protecting drinking water resources in the area, especially during the flooding events. Even for this purpose, stakeholder requires higher alert time (two days or more) in order to prepare preventive actions to ensure the correct functioning of the plants during the flood event. Basic Information on predicted flood solid transport, given for example from turbidity, may be also very useful for drinking water treatment management

It was highlighted that in occurrence of the recent flood in the Veneto region, the drinking water supply system of the City of Rovigo has been stopped for several days, due to the very high turbidity of withdrawn water.

Stakeholders suggested the definition of both quantitative (in terms of water height) and qualitative (in terms of potential sediment load) thresholds, which can provide information easily to be understand among users and stakeholders.

Among the improvements, the definition of defences and management systems to future change in rainfall and flood intensity as consequence of the ongoing climate change has been included. In particular, stakeholders suggested to evaluate if the present structures can be considered suitable even in a different climatic context and, if not, how to change or improve them.

Finally, the students attending the workshop focus on the importance and relevance of dissemination education and training programs and activities, bridging the gap between academia and working life.

2.3.3. Analysis of the impacts of climate changes on drinking water resources

As reported in 2.1, the third BMP proposed conceptual frameworks to take into account the potential impacts on climate changes and land use changes on freshwater resources. The findings of a prototypal study carried out in a small basin of Taro river near the city of Parma are displayed as example. At the moment, the required simulation chain results quite complex involving climate models, statistical tools, approaches to assess ensemble of reliable land use changes and a simplified physically based tool providing insights about the role and significance of ecosystem service on water quality and water quantity. Nevertheless, BMP is aimed to stress the role that such variations could have on water resources and the relevant errors associated to neglecting such variations.

In thematic tables, during the three rounds, the stakeholders have agreed on both the usefulness and the effectiveness of this BMP, underlining also the innovative nature. This BMP is considered as a very useful information tool to support planning (for example to prevent and manage weather emergencies like the one in Belluno Dolomites in early November 2018).

Within the working groups various criticalities of this approach emerged, linked in particular to uncertainty (related to the climate scenarios, economic demographic and present and future irrigation sampling). According the stakeholders, high efforts should be devoted to communicate

in proper way what are the sources of uncertainties, their magnitude and evolution on different time horizons. Nonetheless, for water resource management, the significance of local scale options could highly affect water availability and quality. A reference example is surely represented by crop selection and associated soil management (e.g. the use of irrigation practices or the limitation of pesticides or nutrients). In this sense, BMP should act as a decision support tool providing quantitative evaluations of the impacts associated to different choices at local scale (e.g. in land use management) or at large scale (e.g. under different scenarios of climalterant gases).

Another fundamental issue that emerged from the work was the scale of analysis: for stakeholders it is necessary to extend this BMP to the entire Po river basin and at the same time provide different analyzes at sub-basin scale would allow to better target the investments of water network operators. Indeed, if complemented by economic evaluations, the framework could support the estimations of incentives that could be granted to private individuals or small municipalities ensuring adequate maintenance of ecosystems or sustainable land uses. According operators of water sector, such incentives could be much cheaper than the costs currently incurred for post-event (e.g. after a flood) or recovery activities. In this regard, all the stakeholders considered essential to arrive at an economic evaluation of services provided by different ecosystems or by means of adoption of proper best management practices. Furthermore, BMP could play a relevant role also for properly taking into account social value of adequately managed ecosystems. Finally, several stakeholders suggested adopting the approach also for socio-economic evaluations of induced indirect damages.

The Working Tables highlighted, also, the need to focus on the management and maintenance of agricultural and forest resources with a view to improving water supply.

As regards the evaluation of the operation of this BMP, the suggestions were firstly oriented towards improving communication between scientific results and land use planning tools. According to the stakeholders this BMP should be included in the water resource management plans (local, regional and national) taking into consideration the climate changes and the expected increase in extreme events ensuring a strong training of the technical-planner personnel. Furthermore, the stakeholders consider that the tool could be highly valuable in different fields; among the others, National Irrigation Plan, Basin River Management Plans, and Plans for Geological-Hydrological Risk. Some stakeholder considered, at the moment, that the transfer of the instrument from research to actual planning is difficult.

Several stakeholders highlighted how the value of ecosystem services and BMPs for water resources is more widely perceived by communities in a situation of scarcity (e.g. during a water crisis) and then the approach could provide information not only in average terms but mainly under extreme conditions. Others stated that the findings provided by the approach could help to improve the bad risk perception (often underestimated).

Lastly, much attention was dedicated to the issue of Ecosystem Services (ESs), in particular for some attendee the definition of ES is too close to services where human beings benefit from them and are not focused on the environment. For the stakeholders it is of crucial assigning an economic value or devising an economic and social evaluation mechanism (also in the form of an exchange) of both ESs and damages.

3. Main Results/Feedback

The event give confirmation of the benefits deriving from gathering all the actors involved in water resources and flood management.

The main results of the national stakeholder workshop were:

- presentation of the basic information on the PROLINE-CE project
- presentation of the first outcomes about the pilot action PA3.1 (Po river basin)
- sharing of the main gaps and of the relate proposed Best Management Practices
- deepening BMP effectiveness, implementation, criticality and potential improvements.

The main feedbacks from experts and stakeholders were:

- need for focusing on local criticalities (floods and droughts)
- request for clearer information and simpler indicators for flood drought and climate change
- instance for higher resolution modelling and analysis and for longer forecast lead times
- proposal for integration of climate change scenarios in strategic planning
- first proposals about the implementation of PES
- further, continuous dissemination of activities, projects and operational tools among communities, stakeholders and experts

3.1. Impact and benefits for the stakeholders

Stakeholders recognized the high computational level and further potential application opportunities of DEWS and FEWS systems; furthermore they recognized the institutional responsibility and competence of the Flood Forecast Center and of the Permanent Observatory on Water Uses. They were strongly impressed by activities analysis and tools concerning climate change projections, land use change projection and related impact scenarios.

Benefits deriving for the stakeholders from PROLINE-CE project, especially from the national workshop are:

- awareness of the general framework of the Po river basin, of current activities and of updating mechanism of knowledge and analysis
- information about the main gaps in the Pilot Action 3.1 and of the related proposed Best Management Practices
- opportunity of using information and products derived from monitoring, modelling and analysis tools in current activities of stakeholders

3.2. Transferability to other stakeholders and territories

Best Practices proposed and discussed in the workshop are already implemented and derived from many years of work; that is why a lot of experience is available in hydrological extremes early warning and in analysis of climate change and land use change impacts.

In fact, the Po River Flood Forecast Center is integrated in the National Civil Protection System and derives from technical specifications given in 2004 and from further updating for the National Alerting Network for Hydrogeological Extremes. The Permanent Observatory on Water Uses is part of a National Network instituted in 2016 on all the Italian River Basin Districts and takes place from previous experiences gained since 2003 from the Drought Steering Committee.

Due to the success of worldwide applications, flexibility, open architecture and the compliance with OGC/WMO standards, nowadays FEWS and DEWS operational systems are widely recognized among the most advanced tools at transnational level.

Because of economic growth, social progress and the occurrence of severe weather extremes in all Europe we assist at the increase of the awareness of pressures on water resources deriving from public and private uses. At the same time and increasing need for safety from extreme events, including floods and droughts, arose especially within the most exposed and vulnerable communities. The rise of drinking water issues, and of the whole water resources theme, was also fostered by the dissemination of the first results deriving from climate change projections and land use change studies.

For these reasons tools, methodologies, working groups, expertise and connections we built during the project time of PROLINE-CE are extremely attractive for other stakeholders, territories and institutional realities; in this way they will probably last also after the end of the project and can be transferred to similar territories or similar realities.

3.3. Lessons learnt

The Po river basin has a very high territorial extension, a significant climatic and hydrological variability and an extremely complex social and economic texture, reflecting on natural resources use and preservation. Ecological, territorial and socio economic aspects of the Po valley have experienced and continuously experience significant changes through thousands years of history; agriculture, industry, transport, infrastructures urbanization and climate are among the main drivers of change.

Sharing the experience of PROLINE-CE project with stakeholders put in evidence the importance of water governance and the integration among water and land use policies.

Stakeholders contribution, involvement and acceptance of measures and management instruments, even if often considered, is not yet a common rule for all the activities related to land use management and water protection.

Information and services dissemination, as also the decision support tools linked to flood and drought management may receive lot of benefits from web services and interactive tools.

A deep understanding of different plans addressed to several topics related to water (climate change adaptation, environmental protection, flood risk management, urban areas, agriculture ..) makes possible to highlight potential priorities, externalities, synergies and conflicts among measures developed in each of those plans, to be carefully considered in further implementation steps.

The water governance process as a whole and some of its specific aspects still need a stronger contribution of experts as also the capitalization of transnational and interdisciplinary experience.

4. Photos

Stakeholders attending the meeting

Final resume of round tables

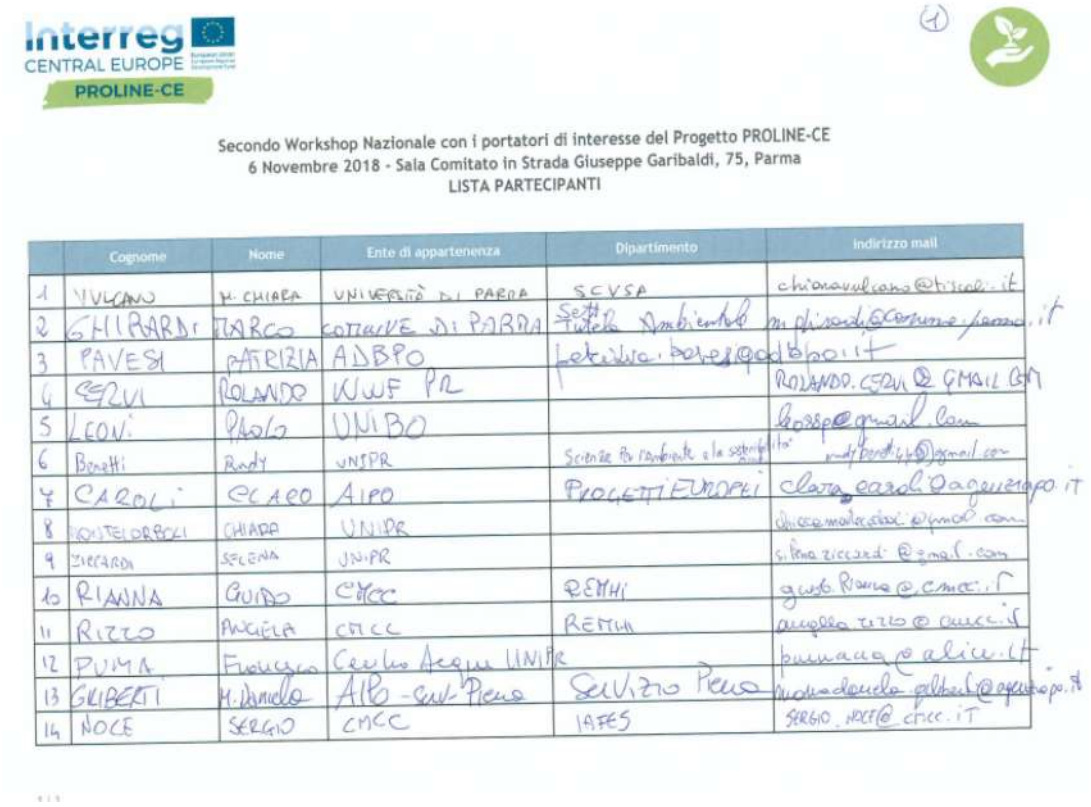
BMP round table n. 1: Droughts

BMP round table n. 2: Floods

BMP round table n. 3: Climate Change

Coffee break

1. 5. Participant list



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6 Novembre 2018 - Sala Comitato in Strada Giuseppe Garibaldi, 75, Parma
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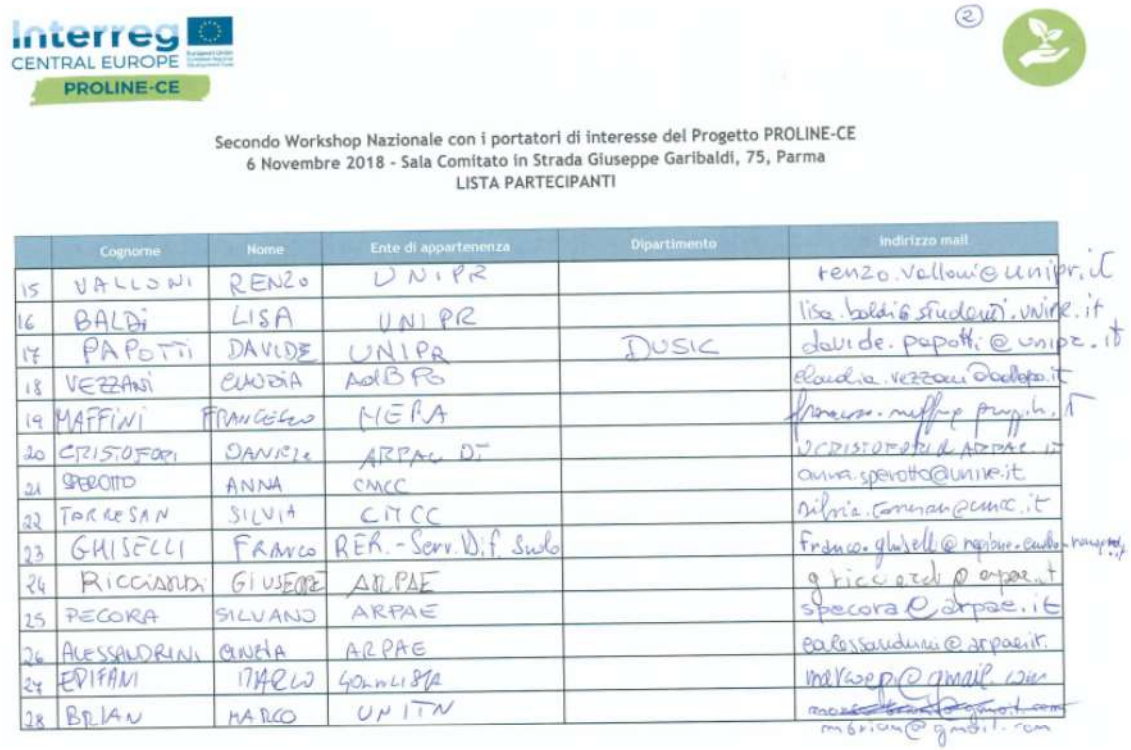

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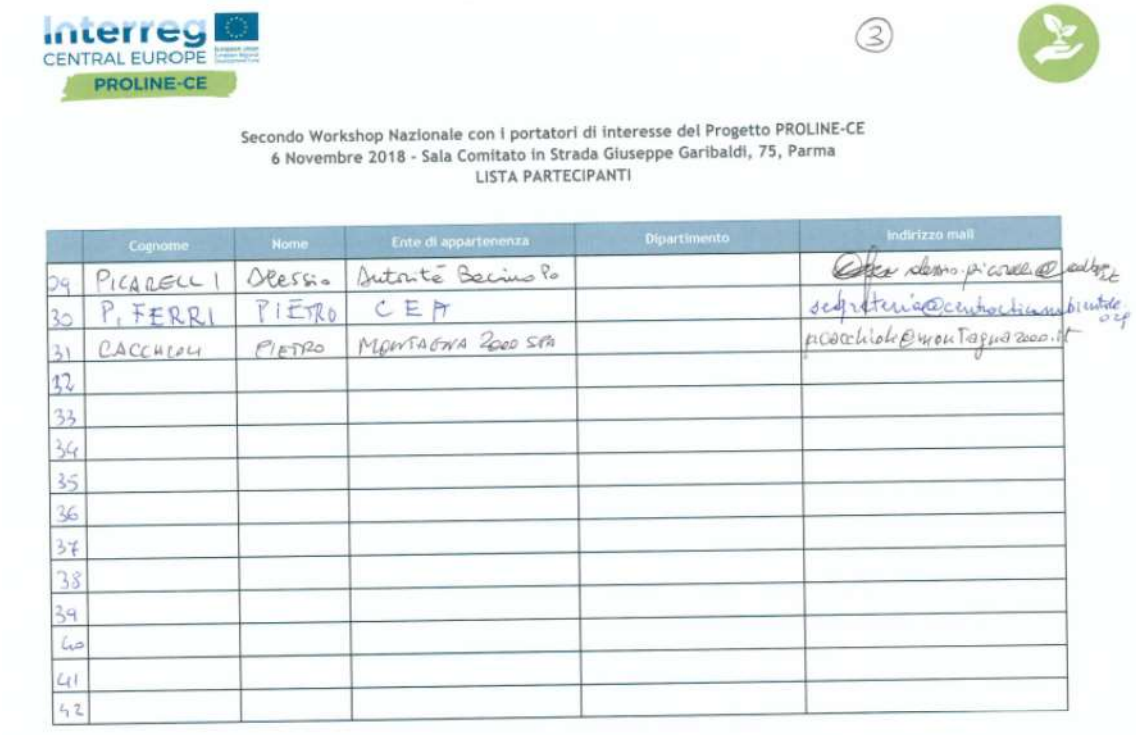

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