

THE FUTURE CAP 2021-2027: A CHALLENGE FOR IRRIGATED AGRICULTURE

POSITION PAPER

Overall Statements

Irrigants d'Europe recognizes the importance of responsible water use in irrigation as part of the European Strategy for the sustainable use of natural resources and commits to support irrigated agriculture reaching good water status and sustainable use goals.

In the past, the expansion of the irrigated area has been influenced by policy measures supporting the provision of irrigation infrastructure and equipment, also as a reaction to extreme climate events. These policies and investments have proved to be fruitful: modern irrigated agriculture has brought economic development and food security to European society. Still, in a large, expanding portion of EU land, irrigation is critical to the viability of family farming businesses. The socio-economic importance of irrigated agriculture within the EU should therefore not be underestimated.

Optimum management of the Water/Food nexus is crucial to ensure sustained economic development in Europe and to implement the Circular Economy. Investments were made to support sustainable and environmentally friendly growth in the sector, which is now among the most advanced and innovative in the agricultural sector and beyond.

Constraints to irrigated agriculture penalise investments in innovation and slow down the uptake of solutions for sustainability in the water/food nexus. The excellent technical capabilities and proved capacity for innovation of European irrigated agriculture must be mobilized in support of the common objectives of promoting quality & sustainable agricultural production, instead of preventing their implementation.

Irrigants d'Europe Position

In light of the current discussion about the CAP 2021-2027 proposal, *Irrigants d'Europe* has adopted the following position:

1. Support viable farm income and resilience across the EU territory to enhance food security

The proven capacity of irrigated agriculture to find new solutions and generate new and sustainable farming systems requires stable and viable farm income to deal with the investment, operation and maintenance costs required to make the management of water resources sustainable. CAP funds need to be allocated for modernisation and expansion of irrigated areas, to enhance food security through the generation of viable farm income, while keeping irrigation sustainable and increasing resilience against drought. Besides investments on farm, CAP should secure parallel and

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coordinated investments on off-farm infrastructures, much needed to enhance the overall water storage and irrigation & drainage water networks. *Irrigants d'Europe* calls for initiatives facilitating irrigated agriculture sector access to financial support and affordable credit for on farm modernization of irrigation equipment and water storage to reduce risk exposure while increasing resilience of irrigated agriculture sector.

2. Enhance market orientation and increase competitiveness including greater focus on research, technology and digitalisation

Investments in novel technologies and innovative solutions should be further stimulated by more flexibility regarding irrigated areas and access to resources, reducing risks for farmers. Particularly moving toward Agriculture 4.0 requires significative and lasting investments in digitalization. Irrigated agriculture is already moving in that direction. The CAP “more targeted, more ambitious yet flexible approach (...) aimed at delivering increased environmental and climate action” must not adversely affect profit-making solutions for fully market oriented irrigated farming systems, for it would lead to harming agriculture competitiveness in the internal and global markets. *Irrigants d'Europe* calls for the recognition of the progress of the irrigated agriculture sector towards sustainable use of water. These achievements must be the ground for CAP focus on research, technology and digitalisation, aiming developing more entrepreneurial and market-oriented irrigated farming systems. However, despite the rapid advances already made, a single CAP administrative cycle does not seem enough to achieve the ambitious objectives set by EU policies. A transition phase longer than the seven-year CAP period shall be supported through measures and programmes extendable over a longer period.

3. Improve farmers' position in the value chain

The current situation, with multinationals shifting risks - including environmental - to farmers in addition to low rewards, is seriously harming implementation of environmental policies and innovation in irrigated agriculture. Present market demand forces farmers to grow more first-class products ensuring steadily increasing levels of productivity and quality standards that only irrigation and fertilisation can guarantee, even despite of the marginal efficiency of the higher supply rate. Non-productive on-farm water use would be reduced by rewarding the positive externalities generated by sustainable irrigation and farming practices and paying farmers a fair price while avoiding charging them for environmental costs and risks. *Irrigants d'Europe* calls for strengthening the position of farmers in the food chain by tackling unfair trading practices. That respect, CAP need to be flanked by a strong food policy.

4. Contribute to climate change mitigation and adaptation, as well as to sustainable energy

Irrigation is often seen as a practice damaging the environment, but when it comes to climate change it is considered as an effective solution for mitigation, besides a primary means for agriculture adaptation. *Irrigants d'Europe* therefore calls for mobilization of resources in the frame of CAP policies aimed to continue the work that has been done to modernise irrigation systems, refurbish and further develop agricultural water infrastructures and water storage facilities. These

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infrastructures should also intend for water transfers between river basins with positive balance to those suffering for negative water balance. *Irrigants d'Europe* strongly opposes any endeavour to reduce resilience in the irrigated agriculture sector limiting farmers' access to sustainable irrigation options. CAP must allow irrigated agriculture to continue to deliver a high level of food security and renewable energy production against a background of increasing climate risks.

5. Foster sustainable development and efficient management of natural resources such as water, soil and air

Efficient management of water resources is the very mission of the irrigated agriculture sector, which has been fostering development for centuries in a way that has been proven sustainable under the environmental and socio-economic pressures of the historical period. Fast changes in the European environment (climate change) and socio-economic structure (decrease of number of farmers, globalisation) are challenging the sector not even for its capability to respond to these new environmental, societal and market drivers but for the very short adaptation time that current policies are allowing. *Irrigants d'Europe* calls for recognising the good results achieved and the efforts already done. CAP shall set realistic goals, taking into account that progress towards sustainable water management in agriculture is evident, and its results will be increasingly evident in the forthcoming years. CAP policies are called as well to help maintaining the agricultural water governance heritage, in terms of culture, knowledge and infrastructures. The future of agriculture and food in Europe will be built on this asset.

6. Contribute to the protection of biodiversity, enhance ecosystem services and preserve habitats and landscapes

An increasing number of protected bird species, amphibians, reptiles and insects found shelter, nesting areas and feed in irrigated cropland. The large extension of irrigated land or canal banks hosts a great number of species and breeders, supporting significant increases in numbers of specimens and their diffusion in new territories. The CAP orientation with respect to water resources would result in the abandonment of irrigation. Thousands of kilometres of canals would dry damaging habitats, with serious losses in biodiversity and ecosystems services. *Irrigants d'Europe* calls for CAP policies considering irrigation water use and productivity not only in terms of agricultural benefits. Calculations must include the environmental benefits that every single cubic meter of irrigation water generates. Ecosystem services should be accounted as benefits already offered by irrigated agriculture and considered to set realistic environmental targets. This change in perception and overall attitude towards irrigated agriculture is crucial to motivate and further stimulate irrigated agriculture efforts enhancing biodiversity, ecosystems services and preserving habitats and landscape.

7. Attract young farmers and facilitate business development in rural areas

Youth participation in the agriculture sector still is low, largely because the sector is highly unattractive and not offering the same income than urban areas. In this respect, irrigated agriculture can secure more stable and high income, and can be more attractive for youth farmers. Young

farmers are more proficient at using ICT skills for farm planning, production and marketing. Irrigated agriculture offers unexploited opportunities for growth in business opportunities, due to its high-tech level, the novel technologies on the verge to be available on shelf and the diffused use of ICT (irrigation management tools, sensors, remote sensing, etc.). Therefore, young farmers will be able to better profit of these opportunities, implementing those innovations not taken up till now by an ageing rural society. *Irrigants d'Europe* calls for actions facilitating the development of new business models able to attract young farmers in the field of specialised, high-tech irrigated agriculture. To reach this goal it is essential to funding digitalization of agricultural production and marketing information. CAP must offer open minded, innovative and bold solutions, seeking for robust sustainable farming business models able to manage dynamic balances between environment and food production.

8. Promote employment, growth, social inclusion and local development in rural areas, including bio-economy and sustainable forestry

Insufficient and erratic water supplies can seriously affect the quality and quantity of employment in the agri-food sector. This constrains agricultural productivity and compromises income stability, with dramatic effects mainly for small farmers. Furthermore, without irrigation, farmers are obliged to turn to crops with shorter cropping seasons, affecting labour demand and supply. Policies for enhancing the value of water used in agriculture are most needed to keep agricultural entrepreneurs in Europe and to create job opportunities through bio-economy and circular economy. In this scenario, qualified workforce and skills aspects are critical for the further development of the irrigated agriculture sector in the EU. *Irrigants d'Europe* calls for water investments and policy enabling, supporting and rewarding improvements in resource-efficiency, water storage and reuse. CAP is called to support irrigated agriculture, bringing increased competitiveness, resilience and security, and new sources of jobs and growth through a viable and sustainable use of water.

9. Improve the response of EU agriculture to societal demands on food and health, including safe, nutritious and sustainable food

Climate change, economic and related crises are already having an impact on food production and demand for food and animal feed, posing serious new challenges to the European food supply system. A healthy food style involving more fresh fruit and vegetable and less animal fat and proteins should be accessible for all EU citizens. Although large part of the fruit, vegetable, oilseed and root crops are irrigated, a diet as such will reduce the dietary water food print with respect to the current EU average. The ecological footprint will decrease in parallel. *Irrigants d'Europe* therefore calls on the European Institutions to draw up, adopt and comply rigorously with CAP policies designed to favouring the production of high quality, safe, nutritious and sustainable food needed to give access to a healthy diet also to those EU citizens with modest incomes, improving their health and life expectancy, whilst reducing diet related diseases and their high social costs. CAP policies are called to avoid the scapegoating of irrigated agriculture or presenting it in an unfavourable light, thus hampering production of healthy food even in regions where a healthy diet is part of the cultural heritage.

10. Fostering knowledge, innovation and digitalisation in agriculture and rural areas.

Digital irrigated agriculture is making its way into farms across Europe, but conditions conducive to the spread of these novel practices must be created. Pilot farms and pioneer investors can effectively foster digital irrigated agriculture uptake in practice, but what makes technologies valuable for farmers is the possibility to apply them in large-scale applications, without limitations on irrigated areas expansion. CAP policies in the past seriously limited irrigated agriculture while calling for fast implementation of innovation at the same time. Only policies accompanying and effectively managing the forthcoming transition phase towards a digital irrigated agriculture will be able to shape the future irrigated cropping systems. *Irrigants d'Europe* therefore calls for CAP policies coherent with the goal to tackle the trade-off between increasing overall irrigated agriculture sustainability, its costs/benefits ratio and the risks undertaken by farmers implementing innovation. CAP must duly consider and responsibly accept that a novel management of the water/food nexus through novel technologies, robotics and big data management could involve initial losses of environmental benefits in view of a long term, viable and sustainable irrigated cropping systems management.

11. Results based payment schemas

A key challenge for the Result based payment schemas (RBPS) delivery mechanism is ensuring their relevance to EU objectives. However, it is often simply not feasible establishing direct links between CAP actions and goal achievement. The most daunting RBPS issue lies in the selection of indicators and where to set the threshold indicator value for payment. Therefore, every RBPS must be designed for the specific context in which it will operate. *Irrigants d'Europe* calls for the active engagement of irrigated agriculture and farmers' representatives as a precondition at every level of the decision processes delivering RBPS management schemas, from the local to the European level. Furthermore, CAP prescription inconsistencies should be removed, allowing a real operational freedom to agricultural water board and farmers to implement the water governance and irrigation solutions they deem most effective to achieve the multiple CAP goals, including but not limited to environmental actions. For this reason, farm-level objectives and results indicators for water/food nexus goals must be: 1) representative; 2) present consistently in the target farmland area; 3) easily identified and measurable; 4) sensitive to changes in agricultural management within the timescale of the CAP but otherwise stable over time; 5) farmers must have confidence in the result indicators and the reliability of the protocols for measuring them; and 6) unlikely to be influenced by external factors beyond the control of the land manager.

12. Multi-actor approach

A common feature of a successful collaborative and multi-actor approach is the key role of local leaders and facilitators. Another element contributing to the success of MAA is the presence of appropriate governance structures and experienced administrations. In some Member States (i.e. Italy, Spain, France and Portugal) the management of water resources is organised via the formation

of collective organisations in which farmers are implicated and has been so for centuries. These organisations have long been in charge of managing water networks for irrigation and drainage from agricultural land and cities, besides soil and land protection in relation to the hydrological aspects, thus they are in the best position to drive MAA supporting CAP 2021-2027 RBPS. *Irrigants d'Europe* calls for recognition of the role of “trusted organisation” or “local facilitator” to the well-established *Consorti di Bonifica* in Italy or *Comunidades de Regantes* in Spain and Portugal, and similar collective agricultural water management organisations over Europe. To effectively set MAA, funding must be secured *in advance* of launching collaborative initiatives in order to avoid risks of failure if funding applications turn to be unsuccessful. Also, funding needs to be available for the entire duration of the project, whose lifespan may, in some cases, go beyond the duration of contracts stipulated under an RDP measure or the seven-year rural development programming period.

13. Strategic management planning

The comprehensive Strategic management planning (SMP) at the Member State (MS) level, entails funding policy on societally identified and recognised needs for intervention, identifying objectives and indicators, selecting the best available measures that can effectively contribute towards reaching the set goals. Considering the bureaucracies in individual countries and the quite blurred image of the economic situation and the influence of agricultural policy on irrigated agriculture, it is likely that an important share of member states will probably attempt to maintain the status quo, wasting the opportunity to reverse the last decades trend adverse to irrigation, thus harming much needed progress towards a sustainable water/food nexus. *Irrigants d'Europe* calls for strategic management planning structured as capacity building, co-fertilisation and co-creation instruments than be mere bureaucratic substitutes of the former MBPS verification and control measures. Priorities must be set by MS in cooperation with irrigated agriculture representative organisations.

Additional Considerations and Rationale

Overall Statements

Rural areas represent 90% of the EU land. About 10.2 million hectares of EU rural land are irrigated and are vital for Europe's future.

Family farms are the nucleus of life in the EU rural areas and the engine of rural growth. Europeans gained access to food of high quality through family farming. In a large, expanding portion of EU land, irrigation is critical to the viability of these farm businesses. The socio-economic importance of irrigated agriculture within the EU should therefore not be underestimated.

By the turn of the century, the concepts of respect for the environment, sustainable rural development, and modernisation of European agricultural practices were progressively integrated into farming operations. Sustainable agriculture moved from science to European political narrative, reaching farmers and their organizations. The European irrigated agriculture sector is aware that

that it can still face a relevant risk of unsustainable water use and that strongly relies on water resources. Rather than standing still, the irrigated agriculture sector has made serious efforts in the last decades to reach sustainability in water use and in food production and to create light footprints. Investments were made to support sustainable and environmentally friendly growth in the sector, which is now among the most advanced and innovative in the agricultural sector and beyond. There is no denying that significant environmental progress has been made by European farmers in the last decades. Irrigated agriculture is at the forefront of this effort, decisively contributing to the production of food, biomass and other social goods (positive externalities).

Optimum management of the Water/Food nexus is crucial to ensure sustained economic development in Europe and to implement the Circular Economy. This raises the question of which policy would be optimal for the next decade, taking into consideration the current challenges in the agricultural sector (coping with climate change, quantity and quality born water scarcity, insufficient water storage, decline in the number of farmers, concentration in the food chain, unfair trade competition, etc.), and the expected positive drivers of ICT, Big Data and other new technologies.

The current large set of Common Agricultural Policy (CAP) prescriptive instruments in place to foster sustainable management of natural resources and the EU water policies are exerting a strong pressure on the irrigated agriculture sector, penalising investments in innovation and slowing down the uptake of solutions for sustainability in the water/food nexus. The excellent technical capabilities and proved capacity for innovation of European irrigated agriculture must be mobilized. This will translate in food security, adaptation to climate change and promotion of bio-economy and circular economy.

1. Support viable farm income and resilience across the EU territory to enhance food security

Application of environmental CAP prescriptions tends to reduce irrigated crops profitability while increasing production costs, especially when limits are set on the use of production inputs, such as irrigation water. It is widely recognised that sustainable irrigated agriculture contributes to a range of public goods such as clean water, wildlife, soil carbon sequestration, flood and erosion protection and landscape quality. These public goods are not producing any direct income for farmers, unless for CAP direct payments when complying with greening prescriptions. In the short-term, the introduction of sustainable techniques will likely increase production costs, reducing the farm gross margin. This will only be partially compensated by CAP payments. The proposed Result Based Payment Schema (RBPS) is not likely to change the cost/benefit ratio of CAP environmental prescriptions significantly for the irrigated agriculture sector.

The combined effect of climate change, economic forces, social conditions and EU policies has increased the frequency and severity of farmers' risk exposure. This is particularly true for irrigated agriculture, operating with high initial investments. Irrigated agriculture sector' ability to adapt to the changing environments has been reduced by fast changes in environmental pressures and by the adverse economic conjuncture. One of the consequences of loss of adaptive capacity is the parallel loss of opportunity, constraining options and resilience capacity. Resilience of irrigated agriculture systems requires the capacity not only to absorb disturbances, but also to reorganize while changes

are taking place so as to retain the same capability to secure sufficient and high-quality production of food and of all the aforementioned public goods.

After some years of economic crisis, irrigated agriculture sector, like the European economy overall, is looping: the progressive income reductions have made it more difficult to access affordable credit and financial support to invest in innovative and sustainable technologies and techniques. Low farm income could place farmers at financial risk, limiting their responsiveness to changes in irrigation water availability. It's well known that for most crops the relationship between the crop yield and the amount of transpired water is largely linear. Thus, sufficient income can be only being generated by higher yields obtained by transpiring more water. Modern, precise irrigation can also address the quality component of price, increasing farm income more than proportionally to transpired water. Moreover, the reduction in public expenditure, mainly in South EU Member States, affects investments in agricultural water infrastructure, much needed to enhance the overall water storage and water governance of irrigation and drainage water networks. Changes in irrigated farming require investments which can only be foreseen if benefits are tangible. As a result, on-farm results impact over the watershed can be undermined by the lack of investments in water storage and agricultural water networks. Besides investments on-farm, CAP should secure parallel and coordinated off-farm infrastructures improvement.

2. Enhance market orientation and increase competitiveness including greater focus on research, technology and digitalisation

Sustainable irrigated agriculture requires technical change. Irrigated agriculture needs to develop novel management skills and competencies to cope with a fast-evolving farming environment while managing competitive and profitable farming. Implementation of precision irrigation needs more entrepreneurial and market-oriented farmers, who run their farms as effective industrial businesses. However, the objective of making profits is central to the idea of irrigated agriculture as a business. This transition will need more than technical solutions to production questions.

A competitive and completely market-oriented irrigated agriculture would operate in the global market and it would not be able to fulfil CAP environmental goals, being more respondent to market drivers than to water conservation. Thereby, strengthening CAP environmental and climate change adaptation policies and goals should foster a non-incremental technological change, as the irrigated sector requires to tackle present and forthcoming water/food nexus issues not giving ground to mere market oriented short time solutions. For that reason, despite the great interest and promotion of precision agriculture in cropping systems, the concept of irrigation as a component of precision agriculture is still embryonic.

Currently, adoption of precision irrigation and its associated sensing, control, and decision support technologies still lacks investments in effective support systems and local customization. Forefront research on precision irrigation is obtaining holistic IT platforms, operating like a learning system able to become adaptive within the irrigation season, thus boosting water productivity and cropping system resilience in a climate change scenario. Robotics and remote sensing will be soon part of precise irrigation management. Broad access to information technologies is a further requisite not only for the adoption of management models and tools, but to profit of the opportunities Big Data

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analysis will soon offer. The European irrigation sector is currently a leader at the global scale, thus investments in novel technologies and innovative solutions should be further stimulated by more flexibility regarding irrigated areas and access to resources, rewarding efforts towards sustainable irrigation and reducing risks for farmers.

On the other hand, CAP “more targeted, more ambitious yet flexible approach (...) aimed at delivering increased environmental and climate action” must not adversely affect profit-making solutions for fully market oriented irrigated farming systems, for it would lead to harming agriculture competitiveness in the internal and global markets.

3. Improve farmers' position in the value chain

Concerns about irrigated agriculture' capability to compete in the agri-food sector arise from the increasing concentration and internationalization of the sector. EU food markets are usually dominated by a few retailers who control up to 90% of the market. Irrigated agriculture producers are confronted with local commercial intermediaries who respond to the requests of a single buyer, usually a large distribution chain. Buyers have a strong market power towards the farmers and dictate prices, terms of sale, and quality standards.

Rather than take up only their buyer power, buyers discard any price and production risk on the farmers, including sustainable sourcing costs. These arrangements in the food chain are preventing retailers and consumers from paying for the environmental costs, while paying unfair prices for high quality irrigated agriculture products. Today, only one-fourth of the retail food price goes to the farmers, compared to approximately one-half just fifty years ago. The current economic model in mature developed economies allows or even encourages large-scale buyers to force farmers to accept supply agreements, whose benefits are overtly skewed in favour of the buyer. In many cases, penalties are imposed for failure to deliver the agreed quantity or quality standards.

As a result, present market demand on weight, shape and size of agricultural products promotes practices that encourage the use of water. Enormous amounts of water are wasted to produce portions of crops that are rejected prior to harvest on grounds of size and physical appearance. This forces farmers to grow more first-class products as a form of insurance against the large number of factors that may reduce the yield or its quality. Therefore, it is imperative for farmers to ensure steadily increasing levels of productivity and quality standards that only irrigation and fertilisation can guarantee, even despite of the marginal efficiency of the higher supply rate. European environmental policies and the strong monopsonistic power on the part of the strong players in the supply chain are furthering the typical global food chain trading flows: agricultural production takes place in a developing country while consumption happens in developed countries. In this scenario, farmers' behaviour is dictated by market pressures or price volatility, hindering any governance of irrigation water demand, and causing water overuse. To improve farmers' position in the value chain, CAP need to be flanked by a strong food policy.

The main problems around the water/food nexus, namely food and nutrition security, healthy food for a healthy life, climate change and environmental issues, access to healthy food also for low income EU citizens, cannot be solved at farm level, as all of them are strictly related with food consumption patterns (consumers side) therefore ask for co-creation of solutions. Significant water

savings and an effective safeguard of water quality will make headway only where a rational use of resources, free of undue market influence and pressure, can improve the cost/benefit ratio.

Non-productive on-farm water use would be reduced by making consumers ultimately pay for environmental costs, rewarding the positive externalities generated by sustainable irrigation and farming practices, and paying farmers a fair price.

4. Contribute to climate change mitigation and adaptation, as well as to sustainable energy

Agriculture is the first victim of climate change. Irrigation is often seen as a practice damaging the environment, but when it comes to climate change it is considered as an effective solution for mitigation, besides a primary means for agriculture adaptation.

The narrative on climate change often disregards that the content of atmospheric CO₂ affects global climate not only through its greenhouse radiative effect, but also through its effect on plant physiology. Elevated CO₂ concentration reduces plant transpiration, triggering changes in atmospheric water vapor and clouds, and affecting surface radiative fluxes, thus producing changes to temperature and the water cycle. The reduction of plant transpiration fluxes is estimated by about -20% in a scenario of doubled CO₂ concentration. Less transpiration means less cooling, with a contribution of about 15% of the total warming potential of CO₂. Furthermore, reduced transpiration increases runoff by about 8% and contributes up to 65% of the expected total increased runoff. Therefore, in absence of adequate provision of irrigation water to crops climate change will be more damaging than expected.

Agricultural water networks will be involved not only to secure water for irrigation but also to drain croplands, and urban areas, with an intensity and frequency never experienced before. The work that has been done to modernise irrigation systems, refurbish and further develop agricultural water infrastructures and water storage facilities need to be accelerated instead of limited. These infrastructures should also intend for water transfers between river basins with positive balance to those suffering for negative water balance. Relieving drought in neighboring river basins is an effective measure for climate change adaptation and mitigation.

Optimising the energy balance and costs is not a trivial issue in irrigation management. As an example, amidst the severe drought of 2012 in many areas of southern Europe irrigation was stopped and crops abandoned because recovery of the high energy expenditure was simply not possible considering the potential yield value. However, zero-energy irrigation districts are close to be a reality thanks to hydropower or photovoltaic energy generation. Moreover, most energy crops are irrigated, and would not be economically viable without adequate water supply. CAP must allow irrigated agriculture to continue to deliver a high level of food security and renewable energy production against a background of increasing climate risks.

5. Foster sustainable development and efficient management of natural resources such as water, soil and air

Efficient management of water resources is the very mission of the irrigated agriculture sector. Irrigated agriculture strives since long time to make efficient use of water in terms of amount, timing and location.

Today's landscape has been shaped for centuries around agricultural waterworks, and even urban areas have been located where irrigated agriculture and agricultural water management provided, and still is providing, better livelihood opportunities. Irrigated agriculture has been fostering development for centuries, in a way that has been proven sustainable under the environmental and socio-economic pressures of the historical period. Fast changes in the European environment (climate change) and socio-economic structure (decrease of number of farmers, globalisation) are challenging the sector not even for its capability to respond to these new environmental, societal and market drivers but for the very short adaptation time that current policies are allowing.

Current policies are mainly looking for and investing in technologies and infrastructures contributing to “a better world”, according to environment protection and long-term sustainability, often without due consideration of the feasibility of the goals and the impact on the competitiveness of European agriculture.

The main concern is not to weaken the environmental component of CAP, instead of fostering integration of an agri-environmental strategy, which requires a broad approach involving sectors and actors other than irrigated agriculture. In this political context, innovation in the irrigation sector is strongly regulated and pushed forward by policies where it clearly drives only greening of agriculture forward. As an example, the CAP Article 46 (Investments in irrigation) requires that all investments in irrigation are subject to requirements such as consistence with the River Management Basin Plans, the setting up of water metering, or conditioned to water savings or the absence of significant negative environmental impacts. This CAP provision will be maintained although Mediterranean areas face an increase in gross irrigation requirements between 4 and 18%, with 2°C and 5°C global warming respectively. Policies are not considering that the overall water abstraction for irrigation is decreasing by about 4% in Southern Europe, even under the pressure of climate change.

Irrigated agriculture, is achieving good results: progress towards sustainable water management in agriculture is evident, and its results will be increasingly evident in the forthcoming years. CAP shall set realistic goals, taking into account that investments made by the irrigated agriculture sector and their unrelentingly efforts to modernise require years to provide measurable results.

6. Contribute to the protection of biodiversity, enhance ecosystem services and preserve habitats and landscapes

The main difference between sustainable and unsustainable irrigated agriculture is that the first increases the capital base over time while the second depletes it, liquidating assets and leaving less for future generations. Even against this background, the demand from environmentalist stakeholders to reinforce the green orientation of the CAP with respect to water resources would result in losses of ecosystem services and biodiversity. CAP often disregards other challenges faced by the irrigated agriculture sector and often overlooks the fact that much has been done already for the natural environment and biodiversity.

As a matter of fact, an increasing number of protected bird species, amphibians, reptiles and insects found shelter, nesting areas and feed in irrigated cropland. The larger extension of irrigated land or canal banks hosts a larger number of species and breeders, supporting significant increases in

numbers of specimens and their diffusion in new territories. The abandonment of irrigation would dry thousands of kilometres of canals and damage habitats, with serious losses in biodiversity and ecosystems services.

Modern irrigated agriculture offers viable solutions also for nitrate pollution issues: extensive use of fertigation is deemed quite effective to increase water productivity while reducing nutrient losses from agricultural systems. Significant water savings can be realised by simply supporting plant water and nutrients uptake with a fertilisation plan, calculated at daily step.

However, only economically healthy farms, with stable high income, will be capable to work in a sustainable and environmentally friendly way investing in innovation providing even more environmental benefits. Irrigation water use and productivity should be considered not only in terms of agricultural benefits. It is not anymore a matter of cubic meters of water per kilogram of food produced. Calculations must go beyond that, including the environmental benefits that this cubic meter generate.

7. Attract young farmers and facilitate business development in rural areas

Young people have become distanced from food production, with more and more of our population living in urban areas. Finding new ways to attract well-educated, skilful, gadget-loving and efficiency-prone youth to farming will require a great deal of efforts. This should be done by offering opportunities to create niche markets or start ventures where produce moves quickly.

Today, youth participation in the agriculture sector still is low, largely because the sector is highly unattractive due to risks, costs, capital and labour intensity and at the same time not offering the same income than urban areas. Agricultural income is seasonally related to rainfall and harvest cycles, suggesting that for long periods of time young farmers would have no income.

In this respect, irrigated agriculture can secure more stable and high income, and can be more attractive for youth farmers. Irrigated agriculture is perceived as a new unexploited frontier for growth in business opportunities, due to its high-tech level, the novel technologies on the verge to be available on shelf and the diffused use of ICT (irrigation management tools, sensors, remote sensing, etc.). Young farmers may find irrigated agriculture more attractive mainly due to faster return of investment with respect to other less specialised sectors.

Furthermore, young farmers are more proficient at using ICT skills therefore, they will be able to implement those innovations not taken up till now by an ageing rural society. However, to reach this goal it is essential to digitize agricultural production and marketing information into web-based resources. This would enable wider outreach and use of hard and soft innovation.

Young professionals can greatly contribute to the irrigated agricultural sector through actively participating in generating, posting, and utilizing information on how manage irrigation more sustainably and effectively. They will also fast spread the most viable Best Management Practices on social media, sharing and tagging knowledge by problems and not by geographical areas. Young farmers not only provide new business models, but also ensure environmental sustainability. The large majority of young farmers feels responsible for guaranteeing a sustainable agricultural sector.

8. Promote employment, growth, social inclusion and local development in rural areas, including bio-economy and sustainable forestry

Insufficient and erratic water supplies can seriously affect the quality and quantity of employment in the agri-food sector. This constrains agricultural productivity and compromises income stability, with dramatic effects mainly for small farmers. Furthermore, without irrigation, farmers are obliged to turn to crops with shorter cropping seasons, affecting labour demand and supply. Water access for agriculture is required to increase and stabilize farmers income, sustain production increase, accumulate assets, invest in innovation and access credit. Such a virtuous circle can create jobs and generate labour opportunities also in extra-agricultural sectors (such as ICT).

In the last decades, European agricultural production has been partially moved outside Europe, where new “free” business models are easier to start. The agriculture left in Europe is progressing towards full automation, up to the point of autonomous robots controlling farms, and precise irrigation implemented for the sole goal of higher efficiency. Moreover, high level of automation can further accelerate the reduction in the number of farmers, further fostering the abandonment of less profitable land and the gradual impoverishment of the rural society. In this scenario, qualified workforce and skills aspects are critical for the further development of the irrigated agriculture sector in the EU.

Policies for enhancing the value of water used in agriculture are most needed to keep agricultural entrepreneurs in Europe and to create job opportunities through bio-economy and circular economy. These policies involve increasing yields, changing from low to high-value crops, reallocating water from low to higher value irrigated agriculture sectors or lowering the cost of inputs. Policies should also optimize the creation of quality jobs and related environmental aspects, achieving more jobs, more food, more ecological services and more income per unit of water.

9. Improve the response of EU agriculture to societal demands on food and health, including safe, nutritious and sustainable food

Climate change, economic and related crises are already having an impact on food production and demand for food and animal feed. This, together with the parallel decline of focus on agriculture and food policy over the last decades, poses serious new challenges to the European food supply system. The societal demand of safe, nutritious and sustainable food in the last decade has not been met for all European citizens. Low-income citizens, the most vulnerable population, prioritize calorie-rich but nutritionally poor foods, with a pattern of decline in dietary quality heralding an increase in health problems as obesity and micronutrient malnutrition. The rate of obese adults has dramatically increased over the past years in most EU countries. In today’s EU, five of the seven biggest risk factors for early death are linked to dietary habits characterized by an up-swinging demand for highly processed meals (cheap, fat and sugar rich, fast and convenience food).

To counter this trend, the World Health Organization and countless scientific studies recommend the Mediterranean diet, which consists mainly of plant-origin foods but not excluding a small proportion of meat and other animal products.

The healthy Mediterranean food style involves a minimum daily intake of 400 grams of fresh fruit and vegetable and less animal fat and proteins. To preserve a good amino acid composition and to

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avoid a nutritionally unsatisfactory diet, the protein removed from the meat group are substituted by protein from oilseeds and root crops. Although large part of the fruit, vegetable, oilseed and root crops are irrigated, a diet as such will reduce the dietary water food print of 18% with respect to the current EU average, saving of about 400 litres per day per capita, more than the daily water consumption of two equivalent inhabitants. The ecological footprint will decrease in parallel by about 24%. The surface of both terrestrial and aquatic ecosystems required to regenerate the resources used and to absorb all the waste products goes from 8,840 to 6,726 m² per year. Thereby, Mediterranean diet is closer to public health needs and has a lower environmental effect than the current average European diet, although involving irrigation.

Therefore, extending sustainable irrigated areas will allow in parallel answering to the societal demands on food and health, supporting production of safe, nutritious and sustainable food needed to give access to a healthy diet also to those EU citizens with modest incomes, improving their health and life expectancy, whilst reducing diet related diseases and their high social costs.

10. Fostering knowledge, innovation and digitalisation in agriculture and rural areas.

Tackling the increasing pressure for climate change adaptation, restoring landscape and ecosystem services, reducing water, nutrients and energy inputs, increasing agricultural resilience and competitiveness on global markets are the current challenges of the irrigated agriculture sector.

The only viable solution to these issues of historical importance is to facilitate a paradigm shift in irrigated agriculture, a new technological revolution, bringing precision farming to be the new productive standard through integrated robotic, ICT and IoT solutions with Big Data and the effective engagement and participation of end users and farmers into the technological development process. The long wave of Precision Agriculture and Irrigation and robotics uptake in practice is indeed promising. Farmers are already doing relevant investments in machinery, irrigation systems and diverse monitoring and sensing devices or services, ranging from drones and automated devices to sensor networks and automated management devices.

Precision agriculture & irrigation methods combined with Big Data management and analysis, promise to increase the quantity and quality of agricultural output while using less input (water, energy, fertilisers, pesticides, etc.). The aim is to save costs, secure return on investments, produce more and better food and reduce environmental impact.

Although, digital irrigated agriculture is making its way into farms across Europe, better conditions conducive to the spread of these novel practices must be created. Pilot farms can effectively foster digital irrigated agriculture uptake in practice, but what makes technologies valuable for farmers is the possibility to apply them in large-scale applications, without limitations on irrigated areas expansion. CAP policies in the past seriously limited irrigated agriculture while calling for fast implementation of innovation at the same time, not accounting for the fact that a technological paradigm shift could involve less environmental benefits in the short time but shall provide far more sustainability options at the end of the initial transition phase. CAP must duly consider and responsibly accept that a novel management of the water/food nexus could involve initial losses of environmental benefits in view of a long term, viable and sustainable irrigated cropping systems management.

11. Results based payment schemas

CAP 2021-2027 proposes to introduce a radically different concept: the Results Based Payments Schemas (RBPS). Whereas the former Management Based Payment Schemas (MBPS) were paying farmers for complying with detailed instructions on how to manage their land, irrespective of whether that achieves the intended objective, RBPS pays for verifiable outcomes. RBPS thus relates to performance, seen as measurable results. Hence, RBPS payments are expected to be more clearly linked to the achievement of the specific environmental objectives than is the case for MBPS.

A key challenge for the performance-based delivery mechanism for the post-2020 CAP is ensuring their relevance to EU objectives. However, it is clearly impossible that RBPS would pay directly for achieving the objective. Establishing direct links between CAP actions and goal achievement is often simply not feasible. As an example, the assessment of water quality goals shall be particularly difficult simply because water moves within the soil profile and within and between fields, farms, and within the whole catchment. Moreover, a measured concentration of pollutants such as N and P can originate by the presence of sediment, excessive rainfall, temperature, floods, droughts, sewage spilling, and abstraction rates other than for irrigation.

In principle, farmers will be free to choose how to achieve CAP greening goals, and there is no requirement, verification or control of the land management used to achieve the result, because achievement of the result indicator is the basis for payment. But how to prove what results have been achieved? It is likely that results indicators will be used as proxies for the water objectives of the CAP. The most daunting RBPS issue lies in the selection of indicators and where to set the threshold indicator value for payment. As an example, concern rises from the CAP 2021-2027 proposal indication of WEI+ indicator as one of those set by EU. Although the WEI+ indicator is taken from the Water Framework Directive (WFD), hence allowing easier understanding between CAP and WFD results, it is actually difficult to apply at a scale suitable for realistic RBPS application. It is possible to modernise irrigation and reduce water abstraction at the same time, stimulate investments in new technologies and precise irrigation through a moderate expansion of irrigated areas. These objectives are not necessarily conflicting. Avoiding responsible expansion of irrigated areas would easily make the investments in modernization and precise irrigation not profitable for farmers thus hindering better water management and water savings goals. Therefore, every RBPS must be designed for the specific context in which it will operate, as for the CAP post 2020 declared intention.

12. Multi-actor approach

Collaborative and multi-actor approaches (MAA) to water management should be an effective means to achieve results set by RBPS. Fostering cooperation between the various stakeholders involved in managing rural areas is an important element finding solutions to the water/food nexus challenges at the local level. Today's political and technical narrative increasingly recognises that bringing multiple actors together to work collaboratively to manage rural land in a way that improves water quality as well as minimising water use can be more effective than focusing on disparate activities on individual parcels of land dotted across the landscape. Also, the European

Court of Auditors in 2011 called for collective approaches involving a minimum number of farmers to achieve clear environmental benefits.

A common feature of a successful collaborative and multi-actor approach is the key role of local leaders and facilitators. Trusted organisations or ‘local champions’ are usually essential to create trust among participants and to support continued engagement in the long term. Another element contributing to the success of MAA is the presence of appropriate governance structures and experienced administrations. A key role for administrations is to support the convening of bottom-up dialogues, roundtables, discussion groups as well as capacity building and training for rural stakeholders involved in soil and water management.

In some Member States (i.e., Italy, Spain, France and Portugal) the management of water resources is organised via the formation of collective organisations and has been so for centuries. These organisations have long been in charge of managing water networks for irrigation and drainage from agricultural land and cities, besides soil and land protection in relation to the hydrological aspects. These organisations - participated directly by farmers and landowners - are in the best position to drive MAA supporting CAP 2021-2027 RBPS.

13. Strategic management planning

Strategic management planning (SMP), the comprehensive strategic planning at the Member State (MS) level, is seen as the crucial element of the CAP 2021-2027 proposal. Strategic management planning entails founding policy on societally identified and recognised needs for intervention, identifying objectives and indicators, selecting the best available measures that can effectively contribute towards reaching the set goals. MS-SMP measures should be then modified accordingly to achieved results or other unknown objective causes for failure. However, available agricultural policy analysis shows that in the majority of MS there is a quite blurred image of the economic situation and the influence of agricultural policy on irrigated agriculture. Thus, which agricultural policy priorities for irrigated agriculture can be targeted by MS if there is no clear image regarding the crucial question that they are addressing?