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Integrated Farming

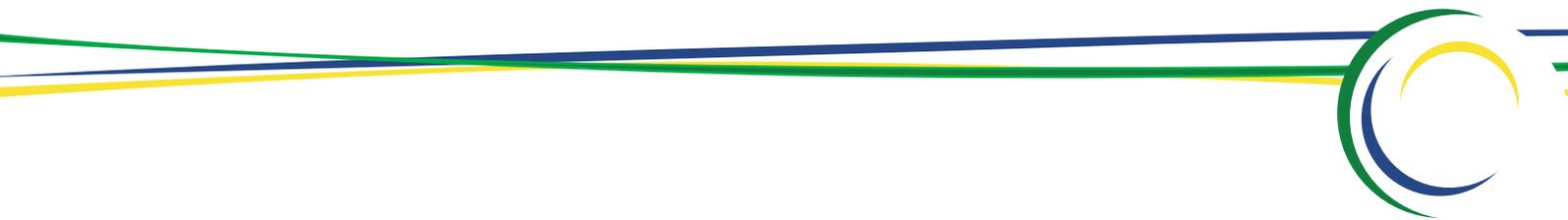
**A holistic system
for sustainable development
in European agriculture**





Integrated Farming

A holistic system
for sustainable development
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Integrated Farming (IF) is more than the sum of its individual parts: it is an holistic and systematic approach, which understands and focuses on the interactions between all management decisions and practices on a farm. It is a dynamic system, equally open for innovation and the best of tradition, with continuous opportunity for further improvement.

With our IF Framework, we have developed and published a detailed description of Integrated Farming which can be applied all over Europe, and on any farm irrespective of its size, location (climatic conditions, etc.) or ownership structure. On this basis, we have developed a set of different publications: the original full text of the EISA Framework (available in English, French and German), and two further documents in English, a shorter Farmers' Version for awareness raising and self-assessment and a brief "political summary" which highlights some key aspects of Integrated Farming. All three publications are available on the EISA website (www.sustainable-agriculture.org).

This set of sixteen single page documents highlights the contents of the eleven chapters of the EISA Integrated Farming Framework. The additional pages expand on related topics. With these key papers, EISA aims to contribute to a better understanding of the complex process of producing sufficient high-quality food while meeting the environmental and social challenges of sustainable development.



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Good organisation, management and planning are the keys to a successful Integrated Farming (IF) approach. Setting objectives and monitoring results provide the means by which performance can be continually improved and the benefits of IF can be quantified and demonstrated. This approach points out short and long term objectives of the farm business and covers areas such as crop performance, livestock performance and welfare, market outlets, environmental commitment and performance, finance and profitability, family considerations, staff training and motivation, as well as local communication.

IF encourages the farmer to look at the whole farm with a considered management and planning approach, which combines the best of traditional practices with the best of modern technology and uses regular internal benchmarking for continuous improvement.

Key issues within Organisation & Planning

- **General considerations**, covering issues such as auditing, certification and assurance, business management mission statement, whole farm management plan, diversification, operating resources plan, whole farm technology concept, whole farm communication concept.
- **Implementation on farm**, including issues such as farm environmental policy, awareness of technology developments, rental and purchase of land, fire prevention and emergency plan.
- **External use and communication of management practices**, covering issues such as communication and participation with local community initiatives, policy statement of responsibility to end customer/consumer and/or food industry contacts, transparent food chain.
- **Evaluation of measures**, including the evaluation and revision of business management mission statement and whole farm management plan and underlying concepts.



Explanation

Integrated Farming is a whole farm management system which enables farmers to identify opportunities and threats and act accordingly, and at the same time consider consumer interests in their business. Traceability is a regular requirement from society, something which IF can address. IF offers the flexibility required to refine farming practices in accordance with developing government objectives. Last but not least, setting up and using a whole farm management plan will help to improve the economic performance of the farming business.

Integrated Farming is not based on a set of fixed parameters but on informed management processes. This knowledge-based flexibility of IF includes attention to detail and managing all resources available. The whole process is capable of identifying adverse effects such as leaching, soil erosion and damage to habitats and biodiversity – and of identifying the measures to reduce or avoid them. In animal husbandry, IF is an effective tool to maintain health and welfare of livestock on farm, to achieve high quality performance and at the same time to reduce environmental impacts.





Standards of employment practice, health and safety at work, and occupational training need to embrace EU standards of employment practice as minimum standard. Inputs can be obtained from many sources but the use of local suppliers and local marketing of produce should be favoured where possible. Using local markets will help to maintain both local business and livelihoods and can also improve efficiency. Besides, open and active involvement of the farmer in local community can help generate transparency and trust. This can include hosting farm visits or holding open days for the public.

Education and training are important prerequisites for sustainable development and help to build on social capital. Farm staff, contractors, and farmers themselves represent the quality of the produce and for environmental protection. Relations between staff on farm, between farmers and business partners as well as with the public are important elements of the holistic concept of Integrated Farming and are essential for the public perception of agriculture.

Key issues within Human & Social Capital

- **General considerations**, including issues such as employee training plan, staff meetings, staff awareness of hygiene importance, working hours, information on site-specific management practices.
- **Fair employment practices for regular as well as seasonal workers**, covering issues such as labour conditions, housing, wages and social security, pension, holiday, sick leave.
- **Workers health and safety**, including issues such as risk assessment to form an action plan to promote health and safety, first aid, accident and emergency systems, annual health checks for staff.
- **Public image and community involvement**, covering issues such as marketing possibilities with a focus on local marketing if possible, demonstration farms, active communication of the farm environmental policy.

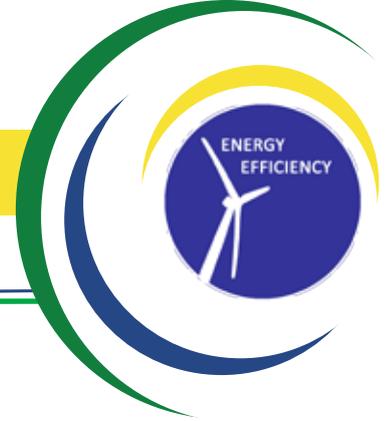


Explanation

Integrated Farming focusses on awareness, continuous learning and improvement. Staff need to be properly trained, and staff, family members as well as contractors must be informed about environmental features of the farming business in order to act adequately and avoid involuntary damage. Besides, regular information and personal involvement of staff and family members in decision making processes help to create awareness and responsibility.

Personal involvement of farmers in their local communities allows for open exchange, understanding and trust is the basis for public acceptance of modern farming. At the same time, transparency and trust are important prerequisites for local marketing opportunities, which in turn help to maintain the livelihood of rural areas.





Integrated Farming is committed to the efficient use of fuels and all other kinds of energy. The improvement of the on-farm energy balance is a key asset for both environmental and economic reasons.

Integrated Farming can improve the balance of energy through identifying principal areas of energy use on farm, identifying key procedures to enhance energy efficiency, calculating energy use and understanding energy opportunities for the future. Beyond striving for a more efficient use of fossil energy, strategies for the replacement of fossil energy by renewable energy sources need to be increasingly incorporated in farming practices.

Key issues within Energy Efficiency

- **General considerations**, including the whole farm management plan for energy use.
- **Agricultural practices**, covering issues such as energy use for cropping, energy use in animal husbandry, two crop systems.
- **Particular environmental practices**, including issues such as use of products with high energy input, use of renewable fuels, energy production from biomass and liquid manure.
- **Evaluation**, covering a regular check of present state and performance as well as targets and measures for improvement of efficiency, safety and performance for the next management plan.



“© UFOP”

Explanation

Awareness of sustainability and responsible management of natural resources are central to Integrated Farming. There are various useful strategies: careful and selective use of inputs, conservation tillage practices, the reduction of fossil fuel requirements, and striving for optimum, rather than maximum, yields. However, when looking at energy requirements for potential savings, trade-offs need to be considered. Reduced soil tillage or no-till strategies may cut fuel costs considerably, but these savings might be out-weighed by additional energy requirements for weeding and other crop protection measures which, invariably, follow non-inversion tillage etc.

These effects will occur throughout the farm, with regard to animal husbandry (housing, feeding, animal health) arable farming, environmental and social aspects, and highlight the importance of the holistic IF approach.





Water is an essential resource for all life on earth. Agriculture, on the one hand, strongly depends on this resource and its availability. On the other hand, agriculture may have potentially negative impacts on water quality due to diffuse pollution for example, which must be avoided wherever possible.

The protection of water and its efficient use are extremely important. Using water wisely on the farm also helps farmers to reduce costs and increase profit margins. Integrated Farming ensures effective planning of water use across the farm and it ensures that efficient use of resources minimises the impact of farming practices on water quality and environmental status.

Key issues within Water Use & Protection

- **General considerations**, covering issues such as water management plan, water protection, efficiency of water use.
- **Agricultural practices**, including issues such as water use compliance, water output control, water use records, monitoring of ditches and water courses, maps of drains in fields and yards, records of new land drainage and identification of outlets, water usage for irrigation, water efficient equipment, water efficient crop lines and varieties.
- **Particular environmental aspects**, covering issues such as separate collection of rain water, run-off control, cleaning of sprayers for crop protection products, storage of diesel fuel close to/for in-field irrigation pumps.
- **Evaluation of measures**, including the evaluation of practices and equipment and the reviewing of the water management plan.



Explanation

Water is our primary foodstuff, and in Integrated Farming the protection of natural ground and surface water bodies is key for maintaining and enhancing the environment, wildlife and biodiversity. The handling of water resources should minimise any unwanted environmental effects and avoid lavish consumption to the greatest possible extent. For farmers, programmes determining crop needs offer a tool to increase water use efficiency.

Besides water usage for irrigation and livestock drinking troughs for example, aspects such as leaching of plant nutrients (i.e. balanced fertilization matching crop needs), sediment entries into surface water bodies via soil erosion (i.e. conservation tillage and green soil cover) and spillage of crop protection products (i.e. environmental protection during mixing and filling of crop protection products) need to be taken into account according to site and situation on any given farm.





Soil is fundamental to agricultural systems and a rich soil ecosystem contributes to crop and livestock performance: “The quality of life below ground determines productivity above”. Good soil husbandry ensures the long-term fertility of soil, aids yield and profitability and reduces the risk of soil damage such as erosion, compaction, and associated environmental concerns. Farmer awareness of soil indices through mapping and examination is an important basis for all cropping decisions in Integrated Farming.

Key issues within Soil Management

- **General considerations**, covering issues such as soil mapping, long term crop rotation plan, soil management plan, advice and technical recommendations for soil management, as well as soil organic matter.
- **Decision making process**, including issues such as monitoring soil quality, soil examination, and assessment of field conditions.
- **Implementation of measures on farm**, covering issues such as records of soil operations, soil cover index, choice of appropriate soil operations, and measures to prevent soil compaction.
- **Evaluation of measures**, including an assessment of measures taken and results achieved as well as a revision of next year’s Soil Management Plan.



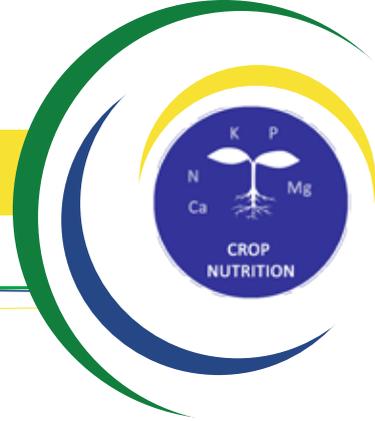
Explanation

Integrated Farming focuses on and encourages continuous improvement in soil management. In particular, this encompasses particularly the management of organic matter as well as strategies and measures to avoid soil erosion and compaction. As agriculture acts in an open system, surrounding environmental compartments such as soil, water and air, as well as fauna and flora, are inevitably used and influenced. However, agriculture is the only production system which can lead to a net-capture of carbon. This carbon is fixed in biomass on an annual basis and also stored in soils via roots and organic matter medium to long term, allowing agriculture to function as a carbon sink.

Maintaining and enhancing soil fertility via sufficient supply of organic matter, tillage practices according to site and situation, balanced cropping sequences and fertilization matching soil and crop needs are key factors for sustainable farming.

Integrated Farming is a holistic and systematic approach. When evaluating the efficiency of resource use for example, it becomes obvious that the interactions between agriculture and “the environment” are manifold and highly complex, as are the interactions between all management practices on a given farm. As a consequence, changes of one particular management practice such as soil tillage may never be looked at in isolation: Altering soil tillage from conventional to conservation tillage or even no-till for example will demand adjustments of fertilization strategies. In addition, new developments in crop production will have to be taken into account. Potentially, even the cropping sequence might have to be adapted.





Crop nutrition as part of the holistic, all-farm approach of Integrated Farming goes beyond Good Agricultural Practice. Key differences are the nutrient management plan and the organic based fertilizer management plan. Both tools are essential for all crop requirement decisions. Spreading technology and tools of precision farming increasingly help to limit applications to the fields and to adapt dosage to varying soil and growth conditions even within individual fields.

Key issues within Crop Nutrition

- **General considerations**, covering issues such as crop nutrient management plans, organic based fertilizer management plan, training for spreading, advice and technical recommendations.
- **Decision making process**, including issues such as calculation of Nitrogen needs, Nitrogen use, Phosphate and Potassium balance in the rotation, secondary and micronutrient deficiencies, soil pH.
- **Implementation of measures on farm**, covering issues such as records of all nutrient applications, storage of manures and other organic based fertilizers, storage of mineral fertilizers, records of import and export of organic materials, maintenance and calibration of spreading equipment, application of fertilizers, use of catch crops, spring ploughing.
- **Evaluation of measures**, including an assessment of measures taken and results achieved as well as updating recommendations and plans for next year.



Explanation

Knowledge of the soil nutrient status is a decisive tool for ensuring that only the necessary and recommended amount is applied. The crops' requirements for nutrients are calculated on the basis of detailed analyses of the farm nutrient status. The decision making process involves crop demands, the supply that is in the soil and available nutrients from farm manure and crop residues. A balanced approach to fertilization is needed, taking account of local situations, thereby reducing risks of environmental pollution by fertilization. Several tools are available to aid decision making: soil sampling for pH, N, P, K, and Mg content; fertilizer recommendation software and books, which give guidance on correct application rates and timing of fertilization; tools to measure nutritional status of crops during growth by either analysing the nutrient concentration or the chlorophyll content (= colour) of the leaves.

However, even if these tools are used, there is no guarantee that crop demands and nutrient supplies will be balanced during the whole growing season. Due to unfavourable weather conditions, pests and diseases, actual crop needs may be lower than expected in a given season. Besides fertilization according to crop demands, proper tillage, adequate choice of varieties and keeping plants healthy are therefore integral parts of the holistic IF concept.





Crop protection following Integrated Pest Management (IPM) as part of the holistic all-farm approach of Integrated Farming goes beyond Good Agricultural Practice.

Key differences are the formulation of individual crop protection management plans, staff training in pest, disease and weed identification as well as training in environmental care and responsibility. Strategies to avoid build-up of pest resistance are a decisive element of IPM.

Key issues within Crop Health & Protection

- **General considerations**, covering issues such as a crop protection management plan, strategies to avoid pest resistance, skills in the identification of pests, environmental responsibility and concern, willingness to learn and improve, training, disposal of unsprayed diluted solutions and surplus chemicals, maximum residue levels, inspection of spraying equipment, emergency plan.
- **Prevention/suppression including the enhancement of beneficial organisms**, including issues such as protection and enhancement of important species, other prevention and management decisions.
- **Observation/monitoring and decision making process**, covering issues such as environmental impact of all crop protection practices, justification of crop protection measures, use of non-chemicals as first resort, threshold concept, crop protection recommendations, determination of crop protection product, application rates and timing, minimising undesired effects of any crop protection measure.
- **Crop protection related practices on farm/ application**, including issues such as storage of products, environmental protection during mixing and filling, observation of pre-harvest intervals, application only in areas where treatment is required, application and machinery movement on field boundaries, storage and disposal of empty containers and surplus crop protection products, cleaning of spraying equipment.
- **Evaluation**, covering an assessment of measures taken and results achieved as well as updating next year's crop protection management plan.



Explanation

Integrated Farming uses and encourages continuous improvement in pest control measures that reduce or minimise risks to the environment and human health and which promote sustainability and profitability. Within Integrated Pest Management (IPM) as part of IF, careful consideration is given to all available crop protection methods including appropriate measures that discourage the development of pest populations and keep the use of plant protection products and other forms of interventions to levels that are economically and ecologically justified. IPM emphasises the growth of a healthy crop with the least possible disruption of the agri-ecosystem and encourages natural pest control mechanisms where possible. A well established and subsequently well managed crop within a suitable rotation and crop mosaic will be more competitive against weeds, more resilient to attack from pests and diseases and should require fewer interventions.





Animal welfare is a source of growing public concern. Integrated Farming employs techniques of livestock management that keep animals in good health, comfort and reduce stress, by feeding, handling, housing and transporting them under the conditions that reflect proper care and concern for their welfare. Under IF, consideration is given to the way decisions are made on the whole farm. This includes animal welfare, grassland, forage and crop management, and the attention to detail demanded in order to ensure sound animal husbandry techniques, environmental responsibility and an economically viable farming business. A herd health plan produced in conjunction with the vet is important to sustainable livestock production, and IF helps focus on the longer term environmental and economic objectives when considering animal husbandry.

Key issues within Animal Husbandry, Health & Welfare

- **General considerations**, covering issues such as livestock identification system and movement records, grouping, field access, transport, evaluation and improvement.
- **Housing**, including issues such as protection against adverse weather conditions, ventilation, space, occupation and comfort, stock handling equipment.
- **Feed and feeding**, covering issues such as feed purchase records and feed quality assurance, feeding, grazing systems, nitrogen excretion, methane emissions.
- **Animal health**, including issues such as herd health plan, disease prevention, bio security, separation, preventive treatment, veterinary medicines, information and training.
- **Animal husbandry and environment**, covering issues such as poaching, nesting birds and forage cutting, holding capacity for manure and slurry, stocking rates, environmentally sensitive areas, nutrient application/crop demand, application timing, incorporation of slurry, phosphorus index, clean water run-off, parlour washing, dirty water and effluents from silos.



Explanation

Within Integrated Farming, livestock is kept and treated according to clear ethical standards. These standards embrace the “five freedoms” (freedom from thirst hunger and malnutrition; from discomfort; from pain, injury and disease; from fear and distress; freedom to express normal behaviour). Health and welfare of farm animals are linked with performance – i.e. only healthy animals which are kept well will deliver high quality produce for human consumption. Farmers practicing Integrated Farming employ and demonstrate techniques directed towards meeting the needs of the livestock and allowing for natural behaviour to the greatest possible extent. Balanced, healthy feedstuff respecting their physiology is essential. Disease prevention plans and all statutory health controls have to be complied with. All treatments administered have to be documented. All veterinary products have to be applied according to EPRUMA principles (for further details, please see: www.epruma.eu). National livestock identification systems have to be complied with in order to ensure traceability of origin, age, race and category of all livestock. Also records of animal feed and fodder, whether produced on site or purchased elsewhere, have to be kept.



Protecting and enhancing wildlife and biodiversity of the landscape is of great importance within the concept of Integrated Farming. Farming practices should always take account of their effects on biodiversity such as the threat to skylarks during mechanical weeding. Maintaining and enhancing the structural diversity of land and landscape features will create floral and faunal abundance and diversity. However, biodiversity goes far beyond a diverse flora and fauna as the term covers the multitude of landscapes, of various habitats and their connection as well as the diversity of crops grown on the farms. Following market requirements and marketing possibilities, the diversity of crops grown on farms has decreased. As a consequence of increased farming efficiency within fields, nature and habitat protection in surrounding areas is ever more important.

Key issues within Landscape & Nature Conservation

- **General considerations**, covering issues such as implementation of the whole farm conservation plan, historical features on the farm, and greening.
- **Agricultural practices**, including issues such as field margins, field margin management within the whole farm conservation plan, non-cultivation under the canopy of trees, native species, field boundaries, leaving winter stubbles before spring cropping, applications of fertilizers and crop protection products to field boundaries and margins, field operations and nesting birds.
- **Particular environmental practices**, covering issues such as time and frequency of hedge cutting, time and frequency of ditch clearance, trees, conservation headlands, small areas of wildlife seed mixes, beetle banks or comparable strips/structures.
- **Evaluation**, including monitoring wildlife and an annual review for the development of the whole farm conservation plan.



Explanation

Farming and environment are inseparably linked. In order to avoid the risk of environmental deterioration, farmers should be able to demonstrate an awareness of the distribution of key wildlife habitats, key species and other valuable environmental features on their farms. They should know the farming operations that could have a detrimental effect on these areas/structures. It is important to inform staff, contractors and advisors about important habitats/historic features on the farm and hence help to avoid involuntary damage. As the diversity of crops grown has decreased, hedges, ditches, margins alongside fields and conservation headlands have become increasingly important, in economic and ecological terms, i.e. habitats for beneficial organisms helping in pest control. In large fields, the use of beetle banks and flowering strips have proven to be of high value for biodiversity. In situations where certain activities such as forage cutting cannot be postponed, particular practices such as mowing from inside out, can help to preserve wildlife.





Wastes – including farmyard manure, for example – must be seen as valuable resources in terms of saving money and reducing pollution. Farming effluents should be managed to optimise recycling and re-use, thereby minimising effects on the environment. Also, the correct storage of hazardous substances and/or material for off-farm disposal and the subsequent proper disposal are important parts of the holistic IF approach. Produce on the farm is to be stored separately to avoid contamination and maintain product quality. Recycling of external materials such as sewage sludge should only be considered if there will be no hazard to soil and environment due to critical ingredients such as heavy metals etc. IF pays attention to detail on every part of the farm, ensuring environmental and human health are a priority at all times.

Key issues within Waste Management & Pollution Control

- **General considerations**, covering issues such as waste handling/waste minimisation, resource management plan, integrated with crop nutrient management plans, professional advice.
- **Implementation of measures on farm**, including issues such as fuel storage and rest oil, recycling of waste oil and filters, maintenance of equipment/machinery to avoid spillage and leakage of fuel and oil, manure management plan, action plan to reduce the potential of pollution on the farm.
- **Product storage and waste disposal**, covering issues such as liquid/solid mineral fertilizer storage, chemical/veterinary product storage, fresh produce storage, packaging facilities, effluent quantities/storage, disposal of crop washings, storage/disposal of empty containers, storage of crop protection products awaiting disposal, disposal of unused/expired crop protection products, storage/disposal of other surplus chemicals, plastic waste disposal, waste products, general waste.
- **Evaluation**, including a review of current practices and subsequent adjustment of relevant management plans and concepts.



Explanation

Agriculture is no different from other industries in that nearly every process and practice results in the production of “by-products” or “wastes” and therefore poses a risk of pollution to the environment if not managed responsibly. In many cases farm “wastes” are a valuable resource and their optimum use can result in cost savings and reduced pollution. In particular, materials that have a high Biochemical Oxygen Demand (BOD) such as slurries or silage effluent can result in serious water pollution problems. Proper storage and disposal of hazardous substances is an important part of the IF whole farm approach as well as ensuring that produce on the farm is stored separately to avoid contamination. Re-use and recycling in regional/national schemes – where available – helps to avoid littering and subsequent environmental hazards, and at the same time keeps valuable resources in the production cycle. Farmyard manure is a particularly valuable resource to be used as fertilizer according to crop needs. However, the best waste management approach aims to avoid waste in the first place. Therefore, Integrated Farming pays attention to minimising waste and recycling where possible.





There is a clear and direct link between agricultural practices and air protection, and agriculture contributes about 10% of the EU's CO₂ eq emissions. The most significant impact on CO₂ removals and emissions in agriculture occurs when land use and soil management are changed, e.g. when permanent pasture is converted to arable land, for example. Among pollutants emitted from agriculture, there are greenhouse gases such as CH₄, CO₂, N₂O and NH₃, volatile organic components, as well as dust and particles. Being aware of different on-farm sources of emissions – such as stables, storing and handling of manure as well as using fossil energy – is an important element to reduce them to the greatest possible extent and ensure farming is sustainable. However, agriculture is the only production system which can lead to a net-capture of carbon. This carbon is fixed in biomass on an annual basis and also stored in soils via roots and organic fertilizers medium to long term, allowing agriculture to function as a carbon sink.

Key issues within Climate Change & Air Quality

- **General considerations**, covering management practices that avoid emissions.
- **Strategies on farm**, including issues such as CO₂ emissions from machinery and fuel use, NH₃ losses in the stable, NH₃ and N₂O losses on fields, Methane emissions from ruminants, aerosol emissions from stables, aerosol emissions from field work and machinery, heating of farm buildings, increase sink function on farm.
- **Considerations beyond the farm gate**, covering issues such as off-farm transportation, odour emissions from livestock keeping, indirect energy needs and related emissions, dust build-up due to wind erosion.
- **Evaluation**, covering the evaluation of practices and equipment and the subsequent revision of management practices to avoid emissions.



Explanation

Besides being just one element of the food chain (suppliers – farmers – retailers – consumers), agriculture acts in an open system, using and influencing resources such as soil, water and air, as well as fauna and flora. Within the holistic concept of Integrated Farming, an understanding of environmental issues is essential. For example, by using fossil energy sources wisely and by increasingly replacing fossil by renewable energy sources such as liquid manure and biomass, effects on climate and air quality can be minimised. By using all inputs such as soil, water, energy, fertilizers, feed, machinery and crop protection products according to the demand of a given field/crop, the input efficiency can be optimised. For example, the amount of dry matter produced per unit of input and hence the carbon sink function can be increased.



Farmers practising Integrated Farming seek to produce wholesome and high quality food sustainably through efficient, economically viable, and environmentally responsible systems. To be sustainable, the farm must be profitable. Profits generate support for all the activities outlined in the IF Framework. Financial support for environmental and biodiversity activities varies throughout the European Community but in all cases requires the farmer to commit labour and planning to such activities.

Some key issues for the Economic Dimension of Sustainable Development in different chapters of the EISA Framework

- **ORGANISATION & PLANNING:** certification and assurance; business management mission statement; diversification; awareness of technology developments.
- **HUMAN & SOCIAL CAPITAL:** risk assessment to form an action plan to promote health and safety; marketing possibilities with a focus on local marketing if possible.
- **ENERGY EFFICIENCY:** whole farm management plan for energy use; two crop system; use of renewable fuels; energy production from biomass and liquid manure.
- **WATER USE & PROTECTION:** water management plan; efficiency of water use; water output control; water use records; water efficient equipment/lines and varieties.
- **SOIL MANAGEMENT:** choice of appropriate soil operations.
- **CROP NUTRITION:** crop nutrient management plan; organic based fertilizer management plan; calculation of Nitrogen needs; Phosphate and Potassium balance in the rotation.
- **CROP HEALTH & PROTECTION:** crop protection management plan; decision making process; threshold concept.
- **ANIMAL HUSBANDRY, HEALTH & WELFARE:** general (well-being); evaluation and improvement; nutrient application/crop demand.
- **WASTE MANAGEMENT & POLLUTION CONTROL:** concept for waste handling and waste minimisation; resource management plan; manure management plan.
- **CLIMATE CHANGE & AIR QUALITY:** CO₂ emissions from machinery and fuel use; heating of farm buildings; off-farm transportation.



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Explanation

Integrated Farming embraces social, environmental and economic issues and puts a focus on using local resources first. The IF Framework is a tool to enhance the farm business. Farm environmental plans and other records are recommended as they allow for monitoring and benchmarking for performance and at the same time for clear and trustworthy communication with business partners/customers and the general public. By striving for optimum resource use efficiency, the profitability of the farming business is increased.

Environmental issues such as the conservation of biodiversity, the protection of ground and surface water and the protection of soils are still considered as areas of global concern. The knowledge-based flexibility of Integrated Farming includes attention to detail and managing all resources available. The whole process is capable of identifying adverse effects such as leaching, soil erosion and damage to habitats and biodiversity – and of identifying the measures to reduce or avoid them.

Some key issues for the Environmental Dimension of Sustainable Development in different chapters of the EISA Framework

- **ORGANISATION & PLANNING:** auditing; certification and assurance; whole farm management plan; farm environmental policy.
- **HUMAN & SOCIAL CAPITAL:** employee training plan; staff meetings; information on site-specific management practices.
- **ENERGY EFFICIENCY:** whole farm management plan for energy use; use of products with high energy input behind; use of renewable fuels; energy production from biomass and liquid manure.
- **WATER USE & PROTECTION:** water management plan; water protection; efficiency of water use; water output control; water efficient equipment, lines/varieties; run-off control.
- **SOIL MANAGEMENT:** soil management plan; monitoring soil quality; assessment of field conditions; soil cover index; choice of appropriate soil operations; measures to prevent soil compaction.
- **CROP NUTRITION:** crop nutrient management plan; advice and technical recommendations; soil pH; storage of manures and other organic based fertilizers; application of fertilizers; use of catch crops.
- **CROP HEALTH & PROTECTION:** crop protection management plan; training; minimising undesired effects of any method of crop protection; applications to and machinery movement on field boundaries and margins.
- **ANIMAL HUSBANDRY, HEALTH & WELFARE:** Nitrogen excretion; poaching; nesting birds and forage cutting; holding capacity for manure and slurry; stocking rates; environmentally sensitive areas; feed efficiency.
- **LANDSCAPE & NATURE CONSERVATION:** whole farm conservation plan; certain area of farm land not to be used for cropping; applications of fertilizers and crop protection products to field boundaries/margins.
- **WASTE MANAGEMENT & POLLUTION CONTROL:** concept for waste handling and waste minimisation; action plan to reduce the potential of pollution on the farm.
- **CLIMATE CHANGE & AIR QUALITY:** management concept to avoid emissions; NH₃ losses in the stable; NH₃ and N₂O losses on fields; methane emissions; indirect energy needs and related emissions.



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Explanation

The environmental impact of agricultural production depends on the efficiency achieved when using all means of production. The input used per kg of output and the output achieved per kg of input are therefore decisive figures for evaluating the efficiency and the environmental impact of agricultural systems.



The very reason for agriculture's existence is to capture solar energy and to convert it into biomass, in order to supply energy to human beings in the form of food, feedstuff for livestock and raw materials for industrial use, and increasingly also in the form of biomass for the production of renewable energy. Whilst fulfilling these needs with a successful farming enterprise (economic dimension), the protection of the environment (ecological dimension) and societal demands beyond production (social dimension) have to be equally addressed in order to meet the requirements of sustainable development. Integrated Farming enables farmers to fully meet these sustainability challenges.

Some key issues for the Social Dimension of Sustainable Development in different chapters of the EISA Framework

- **ORGANISATION & PLANNING:** whole farm communication concept; communication and participation with local community initiatives; policy statement of responsibility to end customer/consumer and/or food industry contacts; transparent food chain.
- **HUMAN & SOCIAL CAPITAL:** employee training plan; working hours; labour conditions; housing; wages; pension; holiday, sick leave; health and safety; accident and emergency systems; annual health check for staff; marketing possibilities with a focus on local marketing if possible; demonstration farms; on-farm visits; active communication on farm environmental policy.
- **CROP HEALTH & PROTECTION:** emergency plan; maximum residue levels; observing pre-harvest intervals; post harvest treatments.
- **ANIMAL HUSBANDRY, HEALTH & WELFARE:** livestock identification system and movement records; bio-security.
- **LANDSCAPE & NATURE CONSERVATION:** whole farm conservation plan; historical features on the farm; timing and frequency of hedge cutting/ditch clearance.
- **WASTE MANAGEMENT & POLLUTION CONTROL:** fresh produce storage; packaging facilities.



Explanation

Integrated Farming embraces social and human capital. This includes employee involvement, training and strict adherence to health and safety aspects as well as the role of the individual farmer in the local community. For the sake of transparency, a complete documentation of all quality systems and potential whole farm audits is suggested. Farm environmental plans and other records are recommended as they allow not only for monitoring and benchmarking for performance but also for clear and trustworthy communication with business partners/customers and the general public.



The challenge for farmers is to respond to changing economic, environmental, social and welfare demands which result from the continuously growing world population and the globally increasing need for food, feed and renewable energy. In addition, environmental issues such as the conservation of biodiversity, the protection of ground and surface water and the conservation of soils are still considered as areas of global concern. By contributing to solving these global challenges, Integrated Farming clearly takes care of consumer interests.

Some key issues for Consumer Needs in different chapters of the EISA Framework

- **ORGANISATION & PLANNING:** certification and assurance; whole farm communication concept; communication and participation with local community initiatives; policy statement of responsibility to end customer/consumer and/or food industry contacts; transparent food chain.
- **HUMAN & SOCIAL CAPITAL:** employee training plan; staff awareness of hygiene importance; labour conditions; marketing possibilities with a focus on local marketing if possible; demonstration farms.
- **ENERGY EFFICIENCY:** use of renewable fuels; energy production from biomass/liquid manure.
- **WATER USE & PROTECTION:** water protection; efficiency of water use; run-off control.
- **SOIL MANAGEMENT:** long term crop rotation plan; soil cover index.
- **CROP NUTRITION:** calculation of Nitrogen needs/Nitrogen use; Phosphate and Potassium balance in the rotation; secondary and micro-nutrient deficiencies; records of all nutrient applications.
- **CROP HEALTH & PROTECTION:** skills in environmental care and responsibility; maximum residue levels; non-chemical means as first resort; observing pre-harvest intervals; post harvest treatments.
- **ANIMAL HUSBANDRY, HEALTH & WELFARE:** transport; space; occupation and comfort; feed purchase records/feed quality assurance; herd health plan; disease prevention; veterinary medicines.
- **LANDSCAPE & NATURE CONSERVATION:** historical features on the farm; certain area of farm land not to be used for cropping; native species; timing and frequency of hedge cutting/ditch clearance.
- **WASTE MANAGEMENT & POLLUTION CONTROL:** action plan to reduce the potential of pollution on the farm; fresh produce storage; packaging facilities.
- **CLIMATE CHANGE & AIR QUALITY:** management concept to avoid emissions; increase sink function on farm; odour emissions from livestock keeping; dust build-up due to wind erosion.



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Explanation

Integrated Farming embraces social and human capital issues and puts a focus on using local resources first. This includes employee involvement, training and strict adherence to health and safety aspects as well as the role of the individual farmer in the local community. Moreover, open communication and information to the public, to customers, to media and politicians are decisive elements of IF as they help to generate understanding, transparency and trust.



Producing food efficiently goes far beyond achieving high yields. It is also about achieving as much output per unit of input as possible. And this refers to all inputs, i.e. soil, water, nutrients, feed, energy, crop protection products, and of course human labour. When optimising the output per unit of input, environmental effects such as emissions per kg of produce can be minimised. And this is where – besides food security – environmental security comes equally into play.

Some key issues for Efficiency in different chapters of the EISA Framework

- **ORGANISATION & PLANNING:** auditing; whole farm management plan; operating resources plan; whole farm technology concept; farm environmental policy.
- **HUMAN & SOCIAL CAPITAL:** employee training plan.
- **ENERGY EFFICIENCY:** whole farm management plan for energy use; use of products with high energy inputs behind; use of renewable fuels; targets and measures for improvement.
- **WATER USE & PROTECTION:** efficiency of water use; water output control and use records; water usage for irrigation; water efficient equipment, lines and varieties.
- **SOIL MANAGEMENT:** soil management plan; organic matter; record of field operations.
- **CROP NUTRITION:** crop nutrient management plans; organic based fertilizer management plan; calculation of Nitrogen needs/Nitrogen use; Phosphate and Potassium balance in the rotation.
- **CROP HEALTH & PROTECTION:** crop protection management plan; protection and enhancement of important species, beneficial organisms and agricultural biodiversity; threshold concept.
- **ANIMAL HUSBANDRY, HEALTH & WELFARE:** feeding; Nitrogen excretions.
- **LANDSCAPE & NATURE CONSERVATION:** certain area of farm land not to be used for cropping; field margins and their management.
- **WASTE MANAGEMENT & POLLUTION CONTROL:** concept for waste handling and minimisation; recycling of waste oil and filters; action plan to reduce potential pollution on farm.
- **CLIMATE CHANGE & AIR QUALITY:** CO₂ emissions from machinery and fuel use; NH₃ and N₂O losses on fields; NH₃ losses in stables; methane emissions from ruminants; increase sink function on farm; indirect energy needs and related emissions.



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Explanation

Increasing the efficiency of agricultural land use, and minimising its environmental effects, needs a systematic approach as presented by the EISA Integrated Farming Framework. Such a holistic approach to efficient land use helps to avoid unproductive losses and efficiency deficits. Producing a healthy crop in a sustainable way will also require disease resistant varieties, soil hygiene, an appropriate crop rotation, balanced crop nutrition, biodiversity, and effective crop protection.





The European Initiative for Sustainable Development in Agriculture (EISA) was founded with the aim of developing and promoting Integrated Farming throughout Europe. EISA members also help create a better public understanding of agriculture through a network of demonstration farms. We bring farmers and consumers together to raise awareness of how farmers are working in harmony with nature to produce high-quality, safe food and renewable resources with environmental and social care.

We work closely with the EU Institutions and other stakeholders to contribute to the development of the EU's agricultural and environmental policies, and we would like to thank all stakeholders and experts who have given their valuable input over the last years. We are looking forward to further sharing and discussing our views and perspectives and the promotion of sustainable development in agriculture.

Background of the Integrated Farming Framework

Beyond the continuously growing world population and the globally increasing demand for food, feed and renewable energy, there are other areas of global concern: climate change with higher temperatures, lower water availability and the invasion of new pests, as well as environmental issues such as the conservation of biodiversity, the protection of ground and surface water, and the conservation of soils.

We are therefore pleased to present a brief summary of our European Integrated Farming Framework. The full version is a detailed document with guidelines, practices and suggestions for agricultural production, covering a wide range of aspects such as "Organisation & Planning", "Human & Social Capital", "Energy Efficiency", "Water Use & Protection", "Soil Management", "Crop Nutrition", "Crop Health & Protection", "Animal Husbandry, Health & Welfare", "Landscape & Nature Conservation", "Waste Management & Pollution Control" and "Climate Change & Air Quality". This full version of the EISA Integrated Farming Framework is accessible in English, French and German via www.sustainable-agriculture.org. A Farmers' version for self-assessment and a brief "political brochure" are also available for download in English on the EISA website.

A tool for two different levels

- For the individual farmer (farm owner, farm manager), the EISA IF Framework offers a comprehensive management tool which helps to further raise awareness, to continually improve everyday farming practice on farm and to achieve progress in all areas of sustainable development.
- For politicians and administration all over the EU, the EISA IF Framework presents the basis for common understanding. It can help to effectively shape legislative incentives and measures.

Developments and innovation

The nature of the EISA Framework as a forward looking and innovative approach will inevitably lead to further revisions in the future. Due to developments in agricultural engineering, in knowledge and experience, and in resulting amendments of the legal framework, items characterised as a recommendation ("should") in the present version will probably be changed to an obligation ("must") in the course of time. On the other hand, we expect that new items will also be added. Therefore, the EISA Integrated Farming Framework and related publications have to be considered as "Work in Progress". We encourage all interested stakeholders to comment, contribute and join us in further developing these Integrated Farming guidelines.





Integrated Farming

A holistic system
for sustainable development
in European agriculture

EISA National Members



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