Agroecological Transitions: A Systematic Review of Research Approaches and Prospects for Participatory Action Methods

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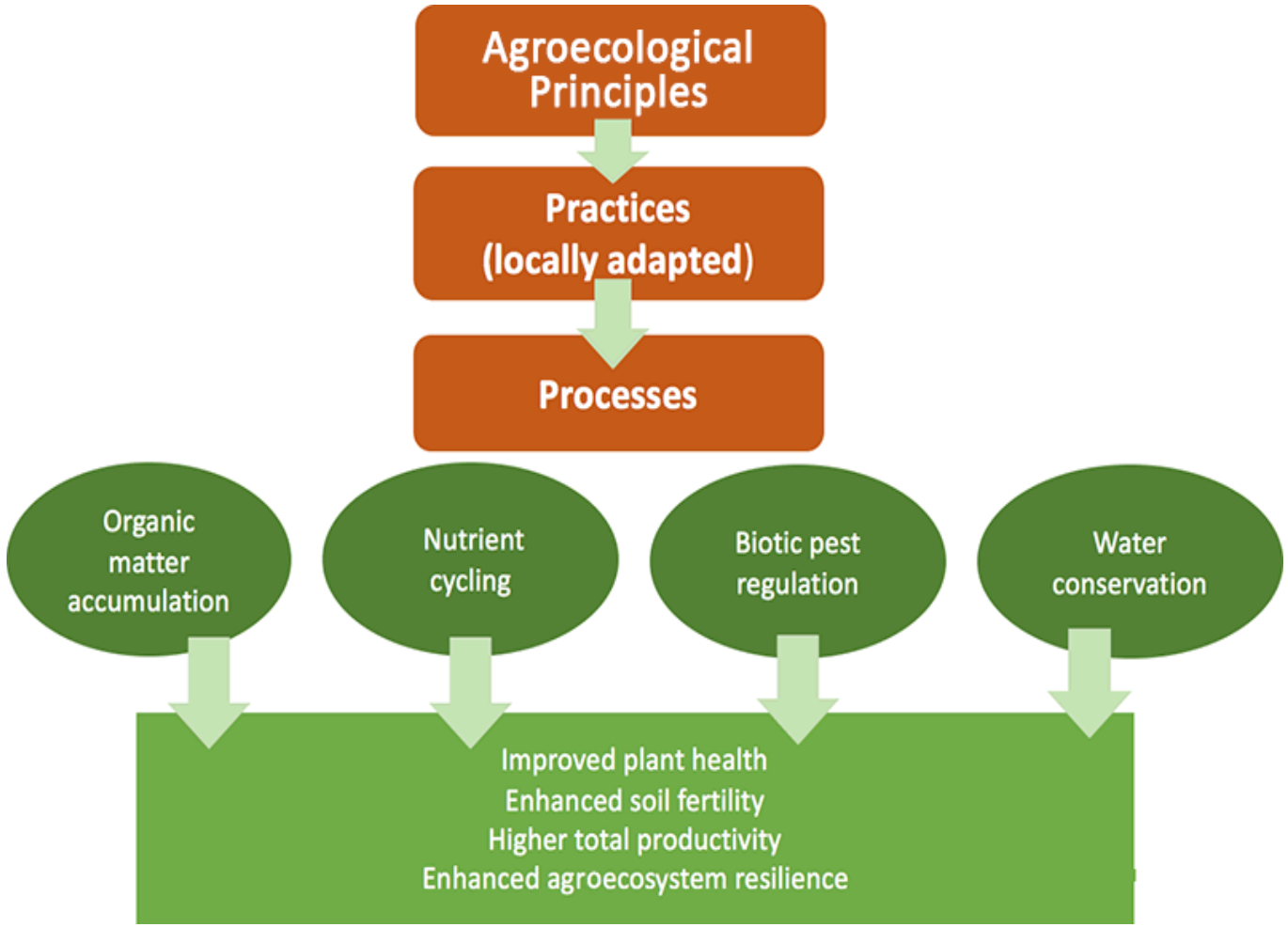
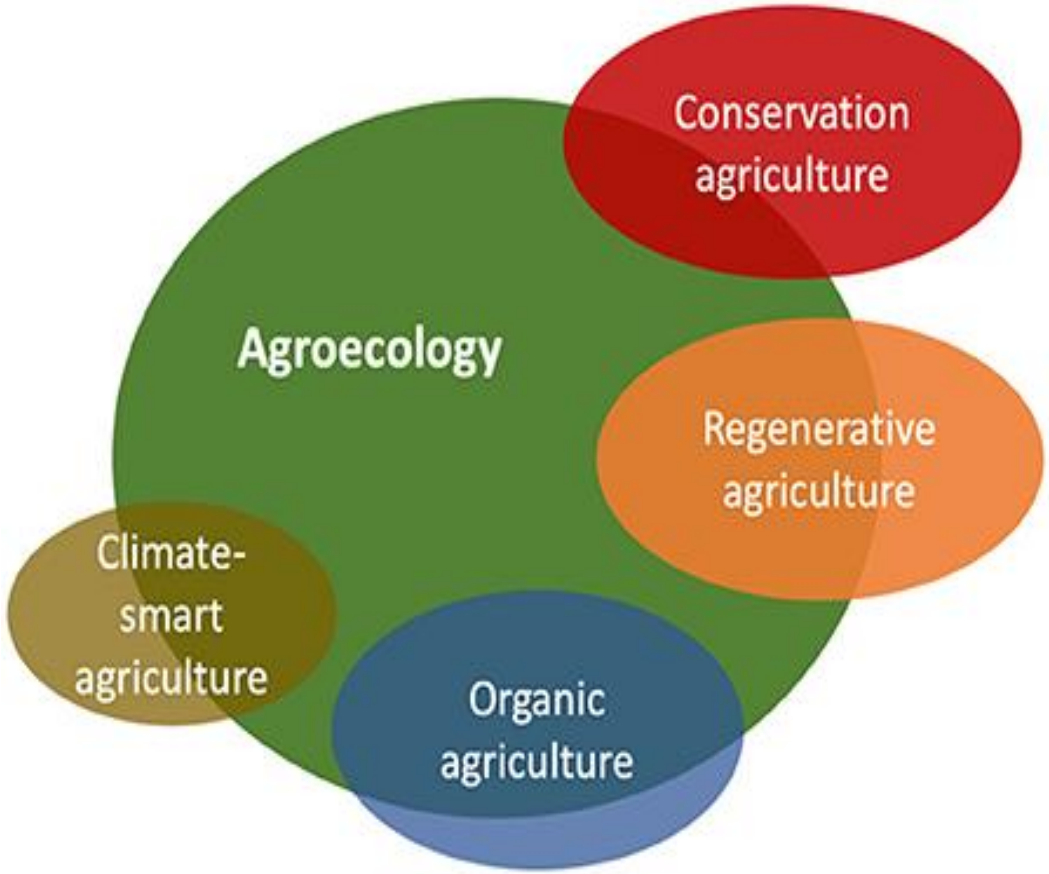
- Agro ecological transition must respond to food shocks and crises stemming from conventional food systems. Key factor play target communities, who are research actors rather than objects, have been proposed as a way to enhance this transition.
- Could be: agroecology to be presented as a reliable alternative to conventional agriculture? even though the definitions vary significantly.

Why we need this kind of transition? to achieving sustainable food systems through ecological principles


Agroecological Principles
Practices (locally adapted)
Processes
Organic matter accumulation
Nutrient cycling
Biotic pest regulation
Water conservation
Improved plant health
Enhanced soil fertility
Higher total productivity
Enhanced agroecosystem resilience

New view point of agroecology

- “as a scientific discipline,”
- “as a set of practices,”;
- and “as a movement.”
- “truly sustainable”
- Transition from plots and fields to food systems and regimes, -related to real food sovereignty movements .
- NOW the debate has centred on the politics of the agroecological transition and food system transformation versus agricultural conformism Indeed, food is at the centre of social-political stability, and agroecology might provide resilience toward food shocks and crises


Conservation agriculture
Agroecology
Regenerative agriculture
Climate-smart agriculture
Organic agriculture


Food Loss & Waste Prevention
Sustainable Food Production
Farm to Fork
Sustainable Food Processing & Distribution
Sustainable food consumption

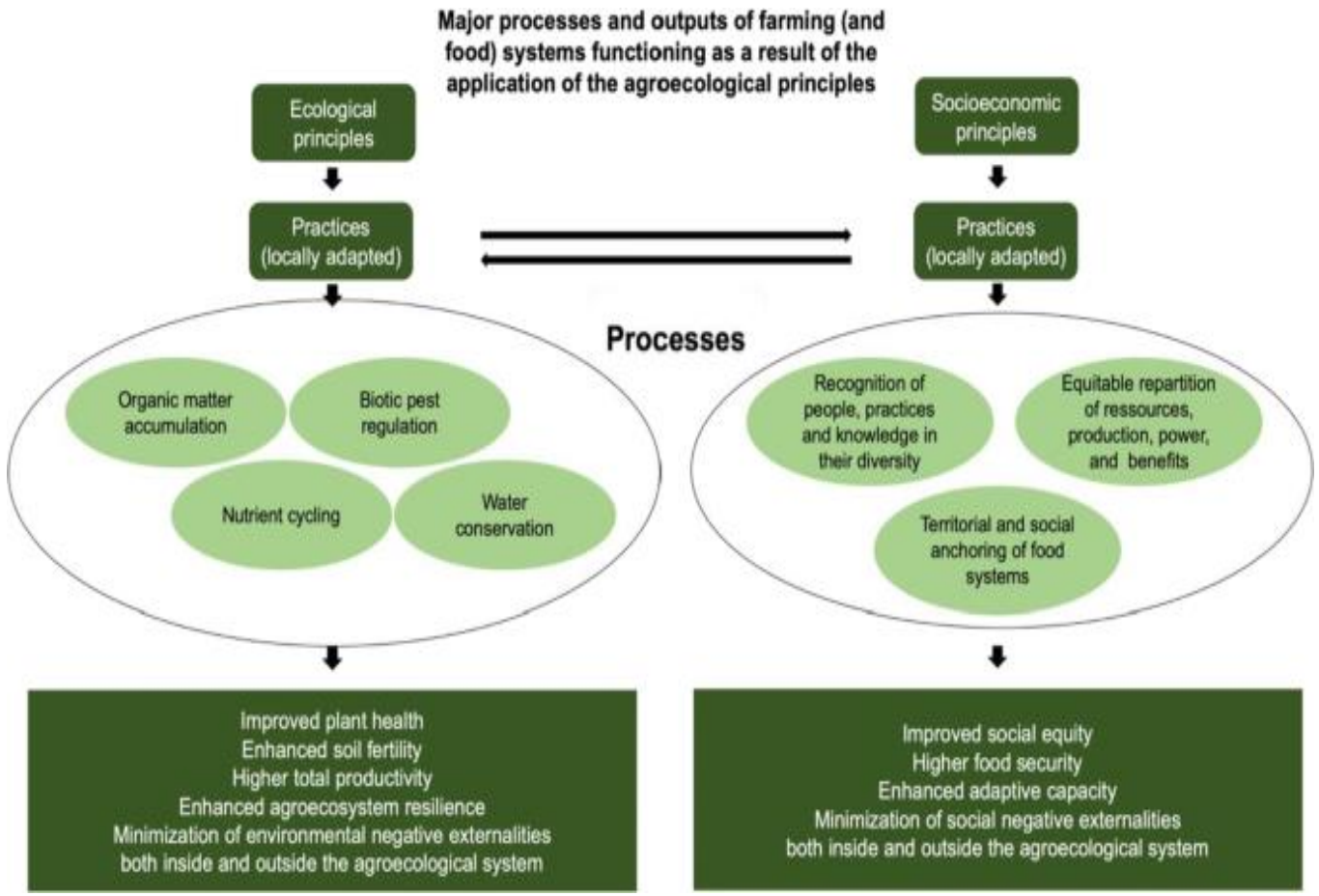
Agroecoligy &Environmental sustainability

- Aimed ensuring better protection of land, water and biodiversity through better utilization of fertilizers, better organization of plant protection, efficient agricultural practices; more efficient use of energy; preserving animal welfare; better waste management in agriculture, etc.
- In Bulgaria there are some less favorable environmental impacts as a result of errors in both the implementation of the agrarian reform and environmental policies– for example, the increase of emissions of harmful substances into the air; cases of water pollution; soil losses; change in the number of habitats, etc.

Why we do this event forAgroecological transition for Bulgaria ?

- To measure environmental sustainability, while at the same time taking into account the specific features and conditions of Bulgarian agriculture;

- To estimate the sustainability index for the environmental aspect and to identify the critical areas that lead to improving the level of environmental sustainability in Bulgaria.
- To support policy making, as the assessment of sustainability performance is an important part of the overall sustainability improving.


Major processes and outputs of farming (and food) systems functioning as a result of the application of the agroecological principles
Ecological principles
Socioeconomic principles
Practices (locally adapted)
Practices (locally adapted)
Processes
Organic matter accumulation
Biotic pest regulation
Nutrient cycling
Water conservation
Recognition of people, practices and knowledge in their diversity
Equitable repartition of ressources, production, power, and benefits
Territorial and social anchoring of food systems
Improved plant health
Enhanced soil fertility
Higher total productivity
Enhanced agroecosystem resilience
Minimization of environmental negative externalities both inside and outside the agroecological system
Improved social equity
Higher food security
Enhanced adaptive capacity
Minimization of social negative externalities both inside and outside the agroecological system

Bulgarian agroeclopgical policy

- Bulgaria is located in one of the regions that are particularly vulnerable to climate change, mainly due to rising temperatures and extreme precipitation. The scenarios developed in the National Strategy for Adaptation to Climate Change (adopted by Decision of the Council of Ministers dated 19.10.2019) in the medium and long term show more intense manifestations of prolonged droughts, heat waves, heavy rainfall and floods. Temperatures are expected to increase by 1.6 to 3.1ºC by 2050 and by 2.9 to 4.1˚C by 2080.

The main expectations

- for agricultural production In National Plan of development of Bulgarian Agriculture presented in the Farm to Fork Strategy and the Biodiversity Strategy are to limit dependence on pesticides and antimicrobials, reduce excessive use of fertilizers, expand organic farming, improve humane treatment of animals, restoration of biological diversity.

Agroecological policy in Bulgaria

- Agriculture has the potential to produce affordable, safe and high-quality products, as well as to contribute to the climate, environment and biodiversity. However, this presupposes the creation of favorable conditions for its accelerated technical renewal and the widespread entry into agricultural practice of digital innovations, allowing the production of sustainable products with fewer resources.

National Bulgarian Strategy from Farm to Fork

- to provide sufficient quantities of nutritious food at affordable prices within the limits of the planet;
- halve the use of pesticides and fertilizers and the sale of antimicrobials;
- to increase the areas dedicated to organic farming;
- to promote more sustainable food consumption and healthy eating habits;
- to reduce food loss and waste;
- to combat food fraud in the supply chain;

- to improve animal welfare.
- to decrease carbon footprint -sustainable carbon cycles (decarbonisation) by:

-forestation with wind break

- growing of legumes crops

- using of live mulches with intercrops

-applying of conserving agricultural practices with keeping peat

The goals included in the plan are:

1. Increase public awareness and knowledge of the risks of developing antimicrobial resistance through effective communication, education and training.

2. Increase and strengthen the data base, knowledge and evidence on AMR in the country obtained through monitoring and research.

3. Strengthening of infection control and prevention measures. Reducing the incidence of infections through preventive actions, good hygiene practices and effective anti-epidemic measures.

4. Optimizing the use of antibiotics in humans and animals.

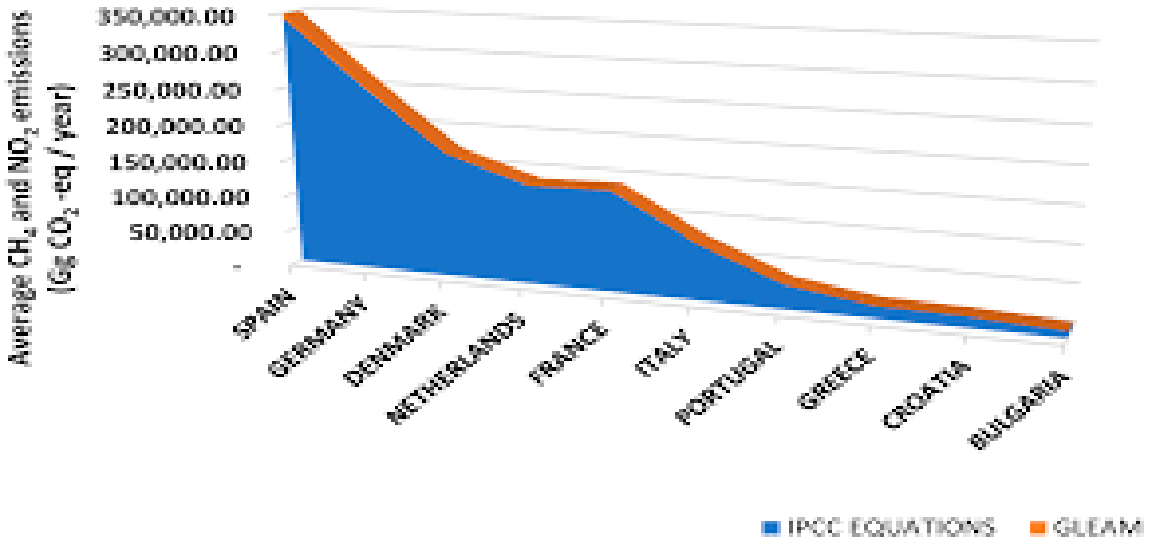
5. Ensuring effective management and coordination, monitoring and evaluation of the National Action Plan against AMR.

Restructuring &Reorientation

- The restructuring of the sector and its accelerated reorientation to develop on the basis of new digital and technological solutions is a serious challenge for businesses. A significant number of agricultural holdings need support to secure the financial resource to carry out the necessary modernization investments that will positively affect their productivity and competitiveness and prepare them to cope with increasing environmental demands. In particular, this applies to small and medium-sized farms, which experience financial difficulties to the greatest extent.

Greenhouse gas emission

- The agriculture sector contributes 11% of the total amount of greenhouse gas emissions in Bulgaria (2016), as a result of activities and processes related to the production and processing of agricultural products, soil fertilization and animal waste treatment.
- The sector is a major source of N2O emissions (about 87% of emissions for the country) due to unsustainable use of mineral fertilizers, manure management and treatment.



Integrated energy and climate plan

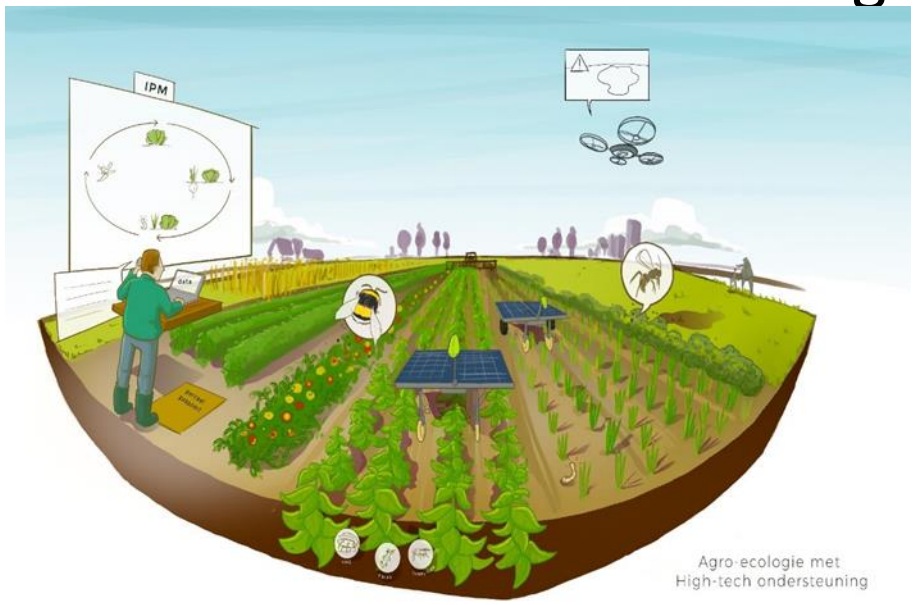
- In this context, the Integrated Energy and Climate Plan of the Republic of Bulgaria 2021-2030 for agriculture sets goals for reducing emissions from agricultural land, reducing methane emissions from biological fermentation in animal husbandry, improving manure management fertilizer, optimization of the use of plant residues, application of water-saving technologies in farms, etc. Their achievement is possible on the basis of targeted investments at the farm level, related to the modernization of production processes and the implementation of environmentally friendly solutions.

Bulgarian Agriculture & climate change

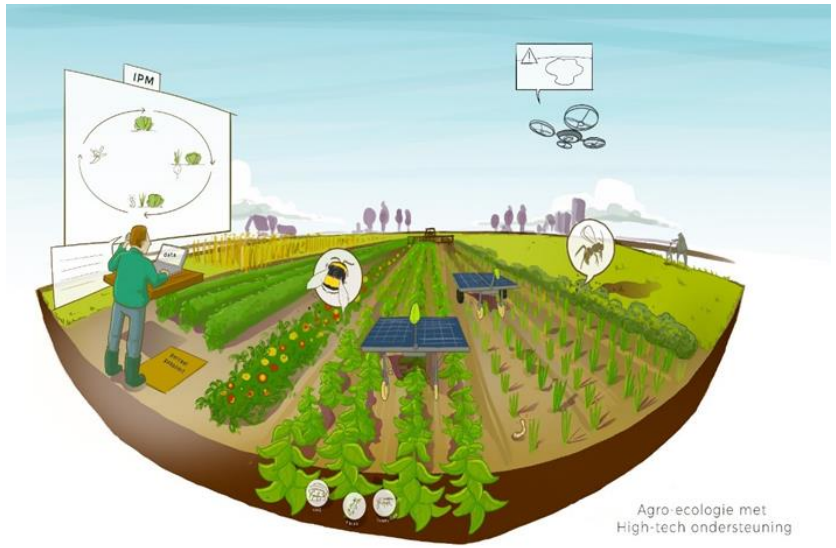
- Failure to take decisive action to adapt agriculture to climate change and to mitigate its consequences will have lasting negative consequences not only for food security and economic growth, but also for the country's natural resources and biodiversity.

The fund for promoting the technological and ecological transition of agriculture

- The fund for promoting the technological and ecological transition of agriculture will encourage investments in the following four areas:
- • Investments in technological and environmental modernization
- • Investments in fruit and vegetable marketing and storage centers



- Investments for the construction/reconstruction and equipment of livestock facilities for breeding and evaluation of male breeding animals, including extraction of biological material from them;
- • Investments related to efficient water management in agricultural holdings



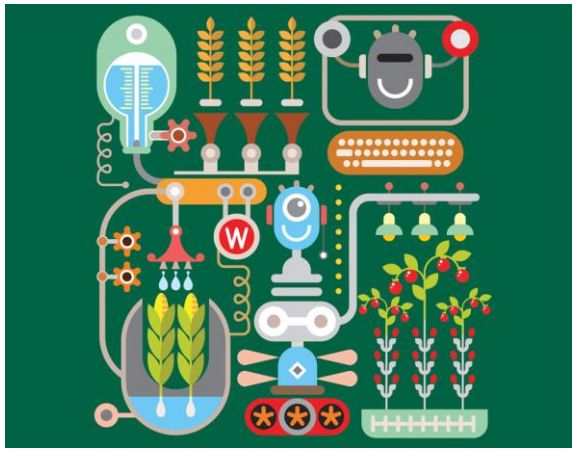
Direction "Investments in technological and environmental modernization"

- The grant will be provided to registered farmers. Indicative list of possible investments:
- equipment/facilities for storing animal and vegetable manure waste;
- equipment/facilities for storing mineral fertilizers, necessary for the production activity of the farm;

- equipment/facilities for the production of energy from(RES) Renewable Energy Sources for own consumption, including those using biomass;
- equipment/facilities for processing waste raw materials from agricultural products used for own consumption;
- equipment for the application of precision agriculture for the protection of natural resources (optimization of soil treatments, the use of fertilizers and preparations for plant protection, etc.);

- investments in mobile slaughterhouses;
- equipment/facilities for the prevention of extreme manifestations of adverse weather phenomena, such as hail, frost, drought
- systems and equipment /including software and/or hardware/ for collecting, processing and analyzing data and information from the various phases of cultivation, production, storage and sale of agricultural products (for crop production - for collection, processing and analysis, remote control, management and monitoring of data on irrigation rates, fertilizer rates, condition of the soil and crops, yields, etc.; for animal husbandry - to track the health status of animals, feeding rates, productivity, etc.)

Automation & robotization



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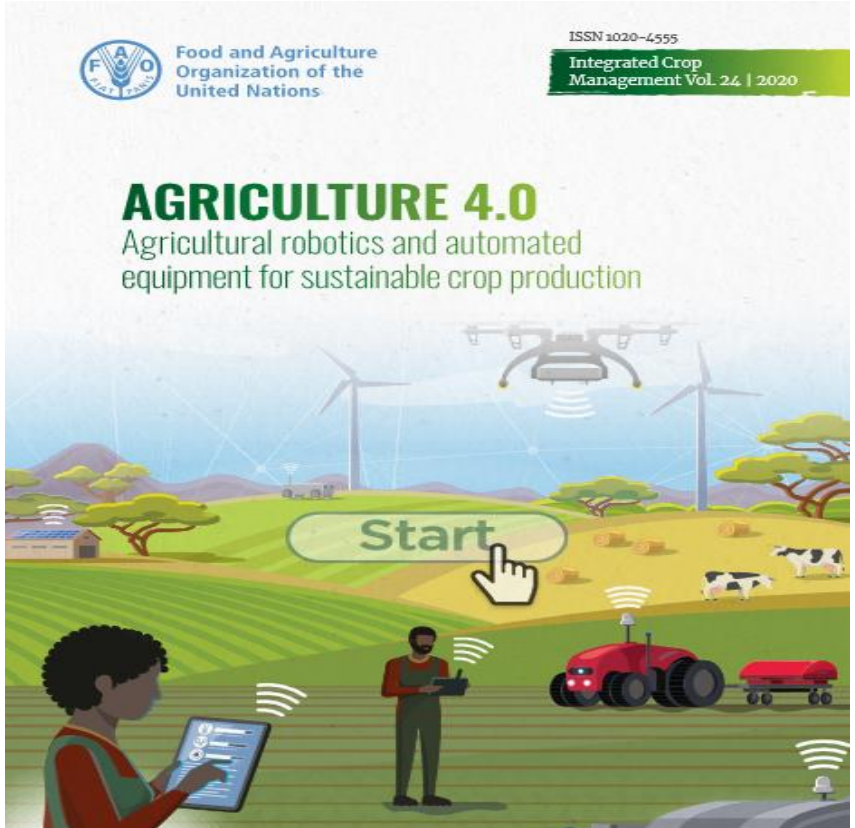
- Digital solutions that improve the process of growing agricultural crops and animals and contribute to optimizing the volume of investments made;
- Automation and robotization of the individual phases of the production processes (for crop production - during fertilization, plant protection, climate management, prevention of adverse climatic events, etc.; for animal production

- Introduction of systems for mechanized feeding, milking, watering and cleaning, systems for management and monitoring of livestock farms, including in beekeeping, fertilizer management systems, electric herders, GPS systems for identifying permanent grass areas, drones, etc.)
- Other assets related to the protection of the environment, climate and natural resources



- All data from huge number of researches confirm that:
- The overall environmental sustainability of Bulgarian agriculture is still far from the high level, although it demonstrates high sustainability in some areas- for example in protection of agricultural land.
- A lot of work is needed in the future to ensure that the agriculture will be friendly to the environment, climate and biodiversity.


Thank
You