обертання, що й у гелікоїдного та осьового вихорів, викликаних обертовим рухом лопатей.

2. Підвищення аеродинамічної ефективності вітродвигуна з кільцеподібним ротором можна досягти за рахунок встановлення хвостового дифузора у формі оболонки зрізаного конуса, який одночасно виконує функції пасивного механізму орієнтації та бар'єру для руху зворотніх вихрових потоків.

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PROSPECTS AND PRIORITY OF RESOURCE SAVING TECHNOLOGIES AS CONSTITUENT OF FARMSTEAD ENVIRONMENTAL CERTIFICATION

Energy saving and rational use of nature resources are fundamental base of sustainable development and its principles are founded on the UN Conference in 1992 (Rio de Janeiro), revised on the World Summit on Sustainable Development in Johannesburg in 2002 and confirmed on the Conference "Rio+20" in 2012. It deals not only with industry and economics, but also with the tourism industry, which leads to certain impacts and threats for the environment.

Rural areas of Ukraine are the centre of agritourism activity, which has became popular in European countries and develops in the world. Agritourism leads to differentiation of economy, broadening the range of rural population activity, it is a source of additional profit, and the most important is that it promotes rational nature management, stimulates owners of agritourism farmstead to apply resource-saving technologies, farming with minimal use of pesticides and fertilizers.

It is still perspective and primary for farmsteads to use energy-saving technologies, which reduce electric power, heat, water consumption due to application of solar heating systems and other alternative energy sources (biofuels, wind generators, solar collectors). It helps solve the problem of rational nature management and nature conservation.

As a result of resource-saving and alternative technologies application it is possible to achieve:

- reduction of product energy intensity due to technological processes improvement and reduction of energy resources losses;
- increase of secondary resources and materials use rate;
- rational self-restraint of resources use;
- application of new systems and devices of resource consumption accounting.

Resource-saving technologies make possible efficient use of natural resources, increase production volumes with the same amount of involved raw material, fuel, main and additional materials. It is one of the important factors for the development of agritourism as environmentally favorable tourism activity.

But control and stimulation of owners for resource-saving technologies application at farmsteads is possible due to environmental certification implementation. It provides unification of tourism activity to single standards, compliance of accommodation and infrastructure with state and international standards. Environmental certification is a key tool for control of agritourism farm offers quality, and those farmsteads, which have got the corresponding certificate, guarantee high quality services and are rather preferred by environmentally conscious tourists.

Environmental certification and categorization will promote environmentally responsible tourism activity, and their criterions are based on stimulation of local development, rational nature management, education etc.

Nowadays in Ukraine there is Ukrainian public non-profit organization "The Union of Rural Green Tourism Development Promotion" that has developed requirements concerning voluntary categorization (only in the area of rural green tourism) "The Ukrainian Hospitable Farmstead" and "The Green Farmstead". Program and requirements are developed on the base of Laws of Ukraine "On Tourism" and "On Consumer Rights Protection", interstate standards for tourist-excursion service and analogous standards of member countries of the European Federation of Farm and Village Tourism EUROGITES, requirements of the State Standard of Ukraine 4268:2003 "Tourist services. Tourism accommodation. General requirements" and the State Standard of Ukraine 4269:2003 "Tourist services. Classification for hotels", regulations and main standards concerning individual and collective non-hotel accommodation.

Proposed list of the requirements deals mostly with external look of farmstead and its territory, farmstead rooms; technical equipment of rooms; sanitary fittings; owners and personnel, their qualification level and service quality.

However, we are considering development of agritourism activity in the context of sustainable development of rural areas, where major attention has to be devoted to ecological compatibility of the intended activity, resource-saving criterions, complex territory agroecological assessment and measures on environment protection.

We suggest extending the list of requirements for awarding farmsteads with the mark "The Ukrainian Hospitable Farmstead" and "The Green Farmstead" and add the following criterions with corresponding index "Ec.":

Requirement	Category (with corresponding mark of ecological compatibility)			
Environment protection requirements	Б.Ec. base	I.Ec. first	II.Ec. second	III.Ec. third
Agroecological assessment of soil condition:				
Agrophysical parameters	-	-	+	+
Agrochemical parameters	-	-	+	+
Environmental condition of soil:				
- heavy metals	-	+	+	+
- pesticides residues	-	+	+	+
- radionuclides	-	+	+	+
Sanitary state of soil:				
-sanitary chemical parameters (sanitary number)	-	+	+	+
-sanitary bacteriological parameters (Coli-titer, titer-Perfringes)	-	+	+	+
-sanitary helminthological parameters (quantity of helminthes eggs in 1 kg of soil)	-	+	+	+
-sanitary entomological parameters (fly larvae and pupae presence per 0,25 m^2 of soil surface)	-	+	+	+
Quality of drinking water	+	+	+	+
Quality of agricultural products	+	+	+	+
Requirements to agricultural buildings location	-	-	+	+
Arterial roads and atmospheric air pollution sources are absent near the farmstead	-	+	+	+
Living and household rooms are situated within the boundaries of permissible sanitary protective gaps	-	+	+	+
Farmstead has environmental certificate	+	+	+	+
Resource-saving technologies are applied at the farmstead	-	-	+	+

Under modern economical, environmental and tourism recreational conditions the most feasible ways of introduction of energy- and resource-saving technologies can be[2]:

– use of non-industrial wood as fuel;
– renewal and construction of new small hydropower plants;
– construction of wind power plants;
– construction of solar power plants.

Application of combined energy sources is also promising:

– wind power plant - new small hydropower plant;
– biogas station – diesel electric generator;
– wind power plant – new small hydropower plant – solar power plant;
– gas-generator plant – diesel electric generator.

Conclusions

Development of agritourism as a type of environmentally oriented tourism activity within rural areas depends mostly on service quality and environment condition. Nature conservation, rational nature management, resource-saving technologies application are primary tasks, which could be solved by the means of environmental certification, which will testify the environmentally favorable management and following the main principles of sustainable development.

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ОЦЕНКА И ПОВЫШЕНИЕ ЭКОЛОГИЧЕСКОЙ БЕЗОПАСНОСТИ АГРОЭКОСИСТЕМЫ НА ОСНОВЕ МОДЕЛЕЙ НАДЕЖНОСТИ

Исследования радиоэкологических процессов в агроэкосистемах важны для оценки и прогноза их экологической безопасности для населения, особенно при формировании дозовых нагрузок. Кроме использованного нами ранее метода камерных моделей, считаем необходимым разработать подходы к более общей оценке надежности и устойчивости агроэкосистемы. Речь идет об анализе агроэкосистемы, как системы транспорта радионуклидов от почвы к человеку, средствах и методах модификации данных процессов и оценки «надежности» данного процесса.