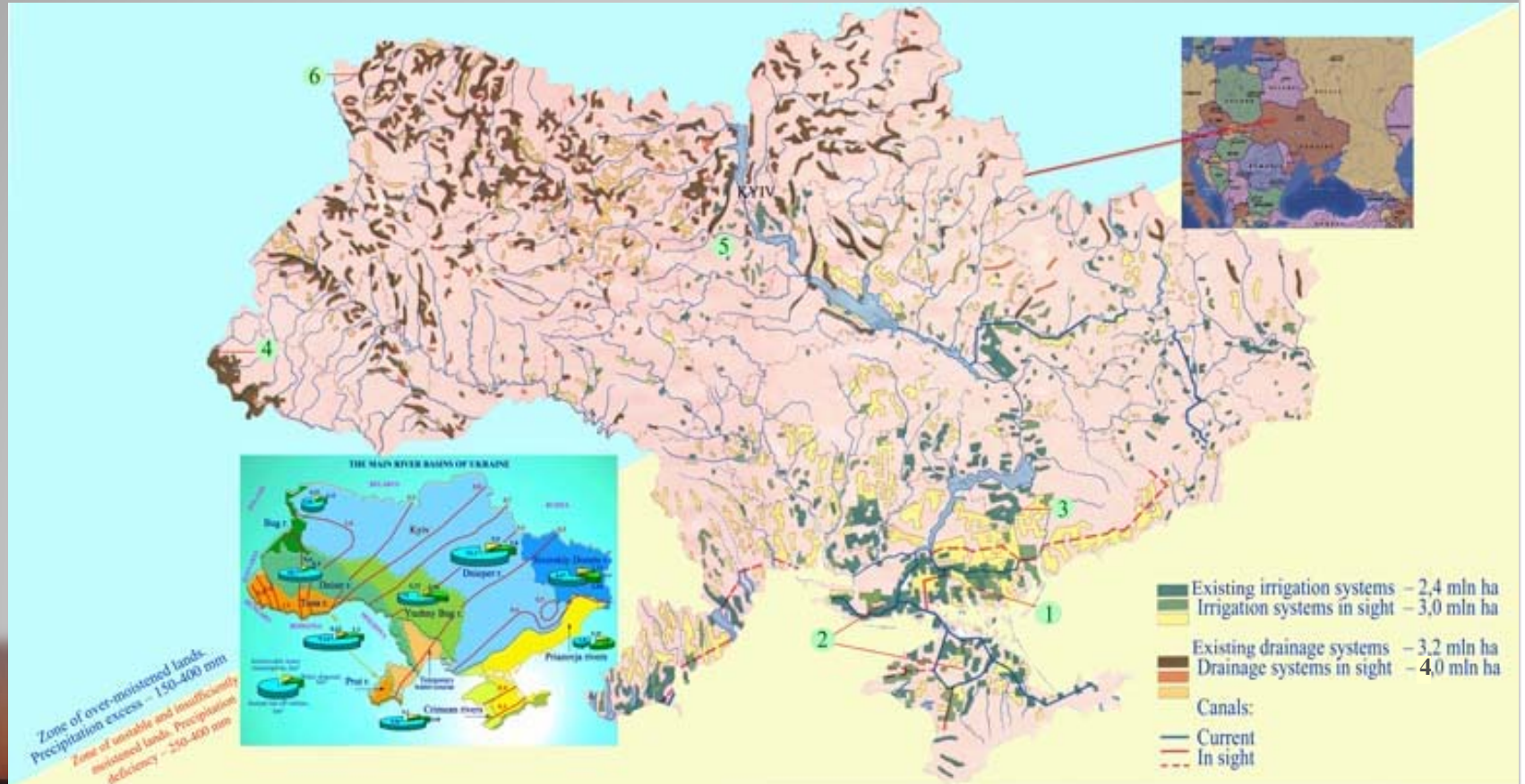


Reconstruction and modernization of reclamation systems as a part of agricultural reforms in Ukraine

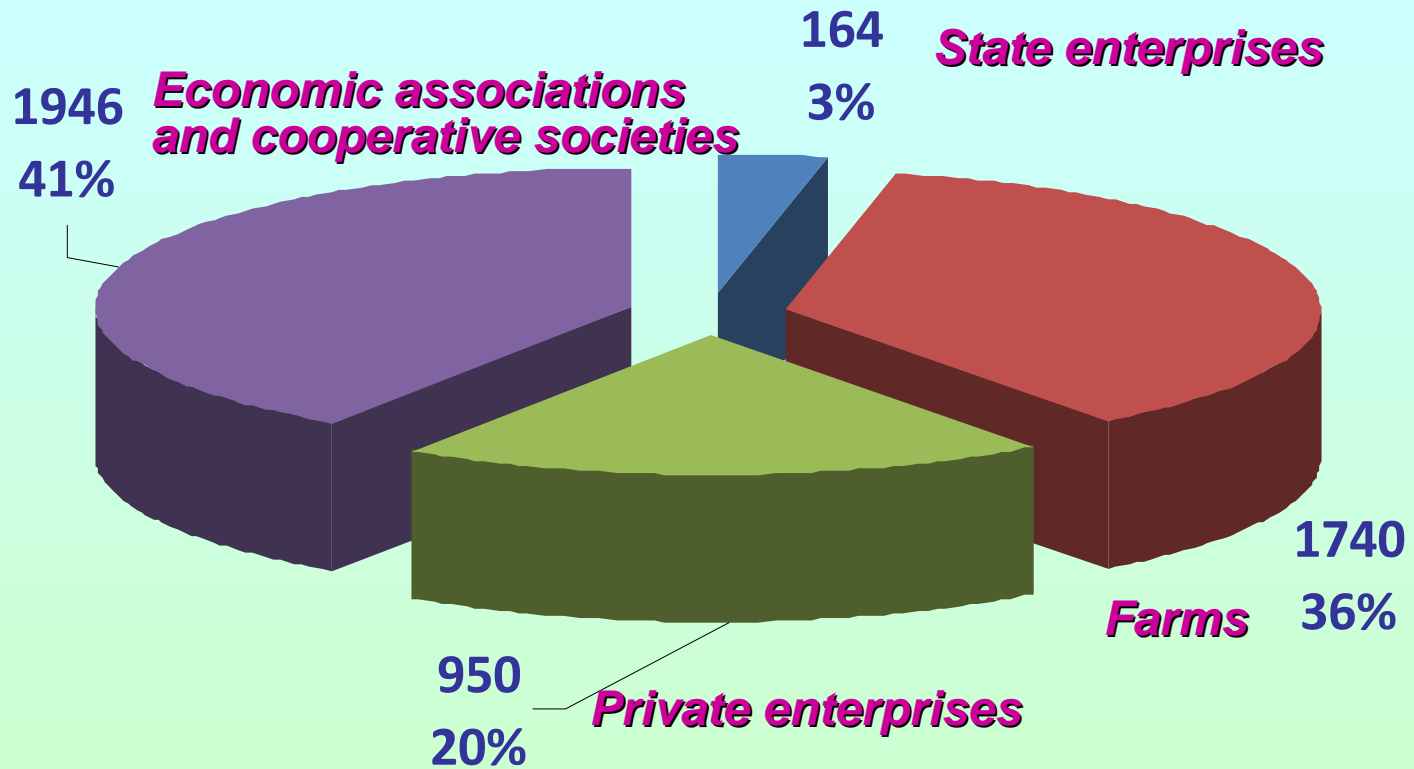
*P. Kovalenko, M. Yatsyk
Institute of hydraulic engineering and land reclamation, Ukraine*



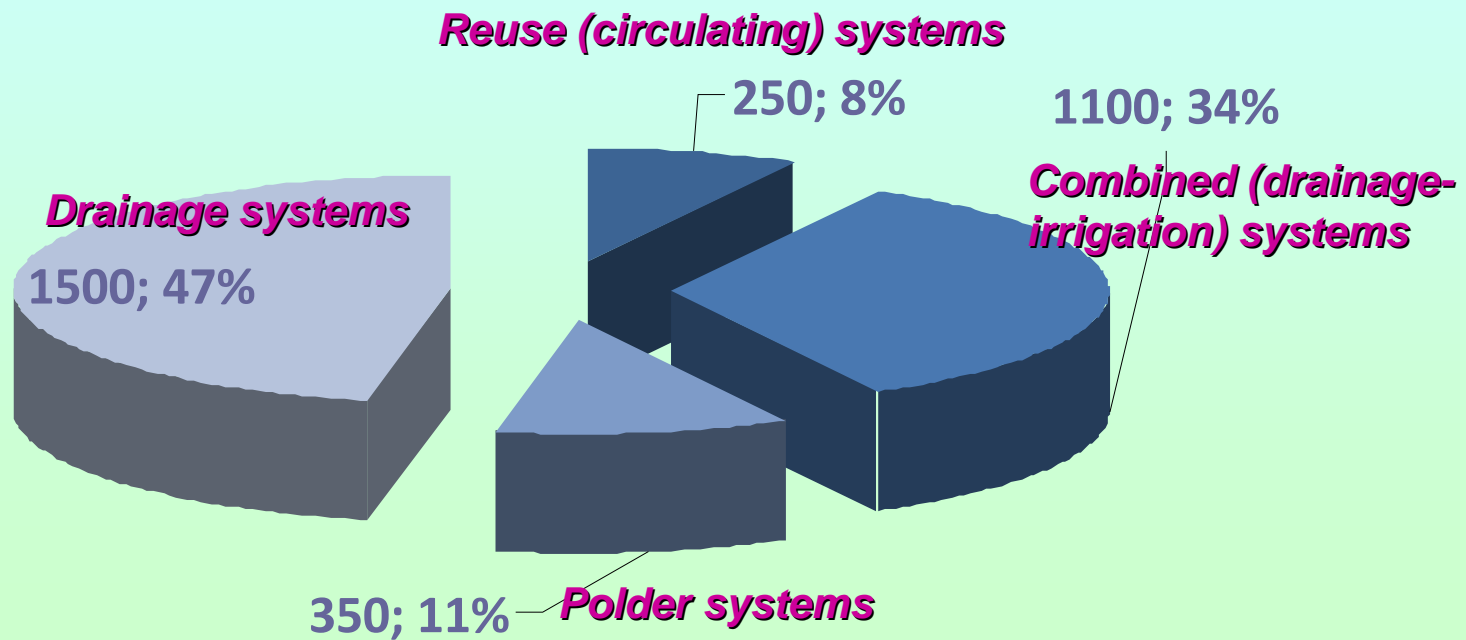
Map of land-reclamation infrastructure in Ukraine



Land tenure within drained lands, 2007



Types of reclamation systems and their share in the total area of drained lands of humid zone of Ukraine



Main technical specifications of reclamation systems:

- **quantity of pump stations – 288;**
- **total capacity - 563,1 m³/sec;**
- **total power - 89,2 thousand of kilowatt;**
- **length of main canals – 43 thousand of kilometres;**
- **number of hydraulic buildings - 25200;**
- **length of collector-drainage network – 123 thousand of kilometres;**
- **length of material drainage – 526 thousand of kilometres.**



The functional objectives of reclamation systems

- **level and moisture control of soil waters according to the requirements of agricultural production;**
- **preservation of surface water quality by use of reclamation systems within flood-lands as buffer ecological zones;**
- **flood prevention and partial accumulation of high water during its passage;**
- **increase of ecological safety in radioactive pollution zone (the territory of "the western track " of the Chernobyl nuclear station).**



The principal causes of production loss the drained lands

- deterioration of financial conditions of agricultural enterprises;
- recession of machine-tractor fleet renewal of commodity producers;
- absence of predicted market of agricultural products distribution;
- non-observance of sown areas structure and crop rotations;
- insufficient land improvement measures - deep tillage, liming;
- interrelation uncertainty between land users and operational water-management organizations in the case of maintenance service of the farm network;
- absence within 60% of systems of guaranteed sources of irrigation water;
- absence of technical means for operative management of water control processes.



Actual ecological and reclamative condition of the drained lands in a zone of the Ukrainian Polissia (1000 ha)

Parameter	Administrative and territorial unit				
	The Chernigiv region	The Zhitomyr region	The Rivne region	The Volyn region	The Lviv region
Total area of the drained lands	272,0	357,8	321,0	346,7	490,0
In satisfactory condition	194,1	317,4	258,3	314,1	432,8
In unsatisfactory condition:					
•of the catch-water	5,8	-	6,3	-	6,5
• of the drainage network:					
- interfarm;	18,0	1,2	2,7	-	17,1
- farm	27,5	19,0	42,9	11,1	7,3
In unsatisfactory ecological and reclamative condition of lands due to:					
-subsurface water levels;	17,7	0,1	1,2	5,9	6,8
- terms of surface water elimination;	-	20,1	3,7	8,5	5,9
- depths of subsurface water levels and terms of surface water elimination;	2,7	-	2,3	7,1	5,9
- average or high level of soil acidity	6,2	-	3,6	-	7,7



Ecological and reclamative monitoring

on the drained
lands

on adjacent territory
(in drainage influence
zone)

on adjacent territory
(out of drainage
influence zone)

Control for:

- regime, balance and chemical compound of water;
- hydro-physical soil condition;
- plant cover condition;
- radio-ecological condition of an environment;
- technical condition of reclamation system



Block-diagram of decision-making on substantiation of reconstruction and modernization of reclamation systems

RETROSPECTIVE INFORMATION COLLECTION

- economic efficiency of reclamative agriculture;
- social and economic indices;
- soil-ecological parameters and evolutionary soil processes;
- estimation of water control efficiency on reclamation systems

MODERN CONDITION ESTIMATION OF RECLAMATION SYSTEMS

- expeditionary investigations;
- on-line methods

EXPERT ESTIMATION ACCORDING TO THE PARAMETERS SYSTEM AND DIRECTION

- organizational;
- technical;
- technological;
- agro-ecological;
- social and economic

CONSIDERATION OF THE PERSPECTIVE ALTERNATIVE SCENARIOS

Gradation of expert estimation of modern condition
1 N

OPTIMIZATION SIMULATION ON DETERMINATION OF COMPLEX RECONSTRUCTION DIRECTIONS

- considering of the interests of interested parties;
- investment regime;
- modern requirements on ecological reliability increase of reclamation systems

Gradation of regime of the further land use on reclamation systems
1 N

DECISION-MAKING ON COMPLEX RECONSTRUCTION AND MODERNIZATION OF RECLAMATION SYSTEMS

Conclusions:

I. Principles of reconstruction and modernization of reclamation systems

- **creation of the block-modular type reclamation systems adapted for environment and requirements of land users;**
- **creation of resource-saving technologies of water control, constructions of reclamation systems with bilateral control of water regime and management facilities of technological processes;**
- **securing of water and land resources rational use, reproduction and increase of soil fertility;**
- **securing of ecological balance within the reclaimed areas;**
- **introduction of scientifically-sound technologies on restoration and agricultural use of the territories polluted with radiation.**



II. For legal support of highly productive use of reclaimed lands it is necessary to develop the following normative documents

- the Procedure of drained lands use and reclamation funds of farm systems;**
- the Procedure of financing costs for maintenance service of farm systems;**
- the Rules of field observation, certification, estimation of technical condition of reclamation systems and ecological condition of reclaimed agro-landscapes and determination of the extent of reclaimed lands renaturalization;**
- the Methods on normalization of anthropogenic load on the reclaimed agro-landscapes in the basins of small rivers-water intakes;**
- Specifications on technical condition estimation of reclamation systems.**





Thank you for attention

