Russian UNEPCOM Pilot Program to restore a lost soil fertility

The Year 2015 has been recognized as the International Year of Soils by the general Assembly of UN. This fact stresses a leading importance of soil in assuring a life on the Earth and developing the human civilization.

Just soil fertility developed by the modern technologies to a high level has made it possible to guarantee the needs of 7 billion population of our Planet in food as a result of the "Green revolution". Furthermore it is obvious the back side of the achievement that is a complex of multiple ecologic problems related to the condition and functioning of the soil cover of the Planet under the anthropogenic and technogenic impact. Among them it is a loss of soil fertility, soil degradation, expansion of arid zones, secondary salinization, technogenic intoxication of soil resources, water and wind erosion, reduction of soil fund of the Plant, lack of soil resources in urban territories, etc.

That is the reason that nomination of the 2015 year as the International Year of Soils along with the statement of the their importance for the life of the Nature and Society in the first place is oriented to explore the most feasible solutions of the key soil and ecological problems mentioned above.

In this connection The Russian National Committee for UNEP (UNEPCOM) initiates a Pilot Subprogram (PSP) to form a wide complex of innovative technologies to restore the lost soil fertility with a required fundamental scientific justification, resource and ecological support.

The Program includes 4 main sections in accordance with universally recognized soil and ecological problems of the highest priority:

1. Rehabilitation and optimization of the actual fertility and water holding capacity of agricultural soils with the use of natural, modified and synthetic bio polymers;
2. Prevention and minimization of the secondary salinization of the root layer of the irrigated lands with the use of natural and synthetic soil modifiers and laminated soil structures;
3. Rehabilitation and remediation of the soil cover of technogenically degradated soils in the regions of exploration, processing and transportation of minerals based on the natural potencial of soils, special additives and soil modifiers;
4. Construction and reproduction of a sustainable soil cover of the city territories under beautification with the use of recycled materials, bio polymers and soil modifiers.

Preliminary pilot researches and technological developments in all four forms mentioned above that have been executed by the Russian UNEPCOM with Moscow State University named by M.V. Lomonosov, Saint-Petersburg Agricultural University, Voronezh Agricultural University, Kuban Agrouniversity and some other organizations have proved a high efficiency and broad possibilities of their execution to restore a lost fertility and other ecological soil functions in different bio climatic conditions.

A number of technologies and technical methods after successful industrial testing have got Patents in the Russian Federation and after a required development and certification in the framework of PSP can be promoted to the international market in the given sphere. In this case Russia has all the chances to export from Russia natural products – soil modifiers manufactured from natural caustobiolithes like peat, sapropel, lignite, humates, etc. and products of organic synthesis like polymer hydro gels, silicon organic soil modifiers and hydrophobisators, etc. Experience of our work in North Africa and results of experiments of processing bottom deposits of the Lake Bam (Burkna Faso) confirm that after mixing the bottom deposits with organic fertilizers like AridGrow and hydrodynamic treatment it is possible to use them as a base for

forming fertile soils for developing agriculture in nearby territories. We have succeeded in manufacturing fertile soil even on desert sands that don't have organic substances at all. Bottom deposits of the Lake Bam in Africa contain little quantities of organic matter and macro and micro elements that can be transformed in soluble forms. That's why a successful use of bottom deposits of the Lake Bam as a base of soil modifiers and soil activators is beyond all doubt.

To fight soil degradation we present a unique technology to restore soil fertility "AridGrow" or "Ideal Soil" that has been developed with support and active participation of Russian Academy of Sciences . The presented technology makes it possible in a very short time completely restore a lost fertility of dry, salty and over cropped soils. After mixing organic soil modifiers with local non fertile soil in specific proportions they ensure all functions of back fertile soil, stimulate fast acclimation, growth and development of any type of trees, shrubs and plants.

Besides organic soil modifiers contribute the formation of grain and cloddy soil structure, reduce soil erosion and leaching of nutrients and increase air permeability of the root layer.

The further development and generalization of presented technologies taking into consideration a big scientific, technological and industrial potential of the Russian Federation for first time in the international practice makes it possible to form an efficient system to restore, maintain and execute an extensive reproduction of fertility and other ecological functions of soils that assure the food security and a sustainable life on our Planet Earth.