

Sawdust Instead of Coal and Diesel Oil or Energy from Waste

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The ongoing administrative and municipal reforms in Russia initiated by Federal Law # 131, as well as the still palpable consequences of the economic and social collapse of the 1990s, have led to a drastic drop of the standard of living among the majority of the population in a large number of rural communities. Many families live in extreme poverty. Municipalities lack resources that could attract investors and the local communities are inactive and are not consolidated. They are often unable to break out of the vicious circle of an inability to earn money on local resources, the low professional level of local leaders, general pessimism and inertia of local residents that only further aggravates economic decline and leads to a still less efficient utilization of internal reserves.

However, Russia is a unique country in many respect including the fact that many of its rural residents who live in want have quite a high level of education and professional experience. This alone makes it possible to improve the situation in communities even with minimum support from outside. Sometimes a small amount of assistance (which may be in the form of a project that promotes public participation in a community) is capable of noticeably increasing living standards, for example, through more rational nature management.

Projects targeted toward supporting community development have more than once demonstrated that many of their participants become activists with a positive outlook capable of influencing local decision-making. This results in an understanding among government and business that seemingly unsolvable problems may be resolved only in conditions of a constructive partnership with the public instead of confrontation.

The New Paradigm of Supporting Rural Communities

Proceeding from the above, FSD has developed a program for supporting communities - Sustainable Development and Jobs in Rural Areas (RURALJOB) – aimed at helping rural communities located in forested areas to address the following issues:

- preserving the natural environment in the process of business activity;
- creating sustainable jobs for local citizens;
- effective citizen engagement;
- ensuring sustainable community development (or, at least, stability and higher living standards) through the use of forest and other renewable resources.

The key goal of the Program was to create viable models of citizen participation in conservation in conjunction with dynamic local economic development based on equal access to natural resources (mainly, forest resources) and their rational use. The fulfillment of this Program in 2007-2009 was funded by the Ford Foundation. The Program, in effect, was a follow-up and a practical implementation of an earlier small research project carried out by FSD - Municipal Energy Saving: Community Development to Improve the Quality of Life and the Environment – also supported by the Ford Foundation in 2006-2007.



Ford Foundation

The **Ford Foundation** is a charitable foundation created in 1936 as an independent, non-profit and non-governmental organization with headquarters in New York to fund programs focused on strengthening democratic values, justice, promoting international cooperation and reducing poverty and advancing human achievement.



Fund for Sustainable Development (FSD) is an independent, non-governmental, non-profit Russian fund created in 2005 to promote regional and community sustainable

development through concrete projects that address environmental, social and economic challenges across the Russian Federation.

Methods

Program goals were achieved by using the following approaches:

- supporting (through education as well) a constructive dialogue and collaboration between citizens, local administrations and businesses in the area of sustainable forest resources management;
- forming partnerships and alliances possessing all necessary skills and methodologies needed for dealing with unemployment and facilitating stakeholder participation, primarily, in the sphere of conservation, rational use of natural resources and sustainable community development;
- helping communities and partner organizations to create and develop environmentally sustainable business based on the use of local forest resources;
- assisting the process of new jobs creation (including through a communications effort);
- informing the public about equal access opportunities to extra income and benefits;
- broadly disseminating approaches, results and expertise acquired in the course of the Program;
- establishing cooperation with neighboring and remote communities;
- promoting created models on a regional level.

Core Principles

Program activities were based on the following core principles:

- Ensuring environmental and economic sustainability and safety of projects and providing them with independent expert assistance (during the projects and after their completion as well) in support of rational utilization of savings;
- Partial project funding from local sources (this guaranteed that in the future a community would be able to raise resources independently);
- Maximum transparency of plans and activities; interaction among stakeholders and citizen groups with professional auditors; readiness to share results with neighbors;
- Project results must clearly demonstrate the sustainability and potential for development after the end of Program funding (dissemination of skills and knowledge obtained at trainings funded under the Program).

In Varnavinsky raion (where regional subsidies account for 80% of the municipal budget) there are 29 municipal boiler plants. Almost 6 million rubles a year were spent from the regional budget for acquiring and delivering coal for these boiler plants, while there were 24 timber-processing facilities with lots of stored waste on their sites.

The projects were targeted toward creating 4 new jobs (shredding and utilizing wood waste) and training local residents to operate modern wood shredding equipment, thus organizing a supply of local fuel (shredded wood waste) to boiler plants in three populated centers that were equipped with special boilers and in the future to other raions.

As a result of these activities, in Mikhalenino settlement, indoor temperature in the buildings increased from 12-15° to 20-22°; heat payments decreased by four times for residents and a number of organizations (the local library, kindergarten, school, first-aid center, and young tourist's center).

Hazardous emissions to the atmosphere dropped by 70% and the volume of stored wood waste decreased by 3,000 m³ a year.



Key Results

A total of 5 projects were carried out in the above municipalities. The results of project activities were presented at seminars joined by local officials, entrepreneurs and citizen of more than 40 municipalities from ten regions of the country. Grants for projects were provided on the condition of co-financing from local or regional budgets. Thus, in Primorsky krai the regional government granted over 4.5 million rubles (three times more than the initial grant) and, in addition, after becoming acquainted with the concept of the project had recommended all municipalities to utilize this experience. Similar recommendations were given by the head of Varnavinsky Raion Administration to his colleagues at the Povetluzhye Association that unites 25 municipalities from five regions of the country.

As a result, in two municipalities 8 new jobs were created, including 2 in the government sector (at the cost of municipal budget savings). Such changes have a long-term positive effect on communities such as in Plastun settlement, where savings were used for hiring an urologist and a nurse for the local hospital and acquiring equipment for crushing kidney stones, which is the only one in the region outside of its capital, Vladivostok. Today, in Plastun, residents of four raions

undergo complex surgery (this not only enhanced the prestige of the raion, but also helped it to receive additional funding for the local budget and considerably decrease expenses for treating hundreds of patients who live on an area equal to that of Slovakia).

After the end of the projects, heating costs in Varnavinsky raion decreased by over 2 million rubles a year and in Terneisky raion by 5 million rubles.



Plastun is the largest settlement of Terneisky raion, which is the largest and northernmost raion of Primorsky krai. The settlement is achieving rapid economic growth: the local port is being expanded and new woodworking factories are being built. This results in growing amounts of wood waste. Wood chips and sawdust are excellent fuel, but until recently the boiler plant of the local hospital worked on diesel fuel that was delivered from elsewhere, which cost the municipal budget 6.5 million rubles a year.

The idea to convert the boiler plant from the use of expensive fuel to one that is practically free was first suggested four years ago. However, special boilers had to be installed to burn sawdust and wood chips. Funds for this project were collected from various sources: over 4.5 million rubles were allocated from the regional budget; 1.5 million rubles was a grant from the RURALJOB Program; nearly 1 million rubles came from the municipal budget; and 600,000 rubles was a contribution from the utilities company servicing the boiler plant.



As a result of this effort, two AKM boilers working on wood waste and manufactured in the city of Tver were installed in the boiler plant. The boilers have rotary grates that direct hot air to sawdust drying, which allows using wood waste with high moisture content. The efficiency of the new equipment is 80%.

Fuel savings (nearly 5 million rubles a year) will allow to quickly return the invested funds. Another advantage is the improvement of the environment: after the old fuel stopped to be used, emissions of hazardous matter to the atmosphere dropped drastically (sulfur dioxide by half, nitrogen oxide by 2.3 times and carbonic oxide by 3.4 times).



Implementation

The Program consisted of two phases. During the first, projects were carried out on two model sites: in Varnavinsky raion, Nizhny Novgorod oblast, and Terneisky raion, Primorsky krai, which were selected in a contest held among over 20 municipalities. Despite the abundant forest resources, well-developed timber processing industry and large amounts of wood waste, the administrations of both municipalities were spending up to one-fourth of their budgets for purchasing coal or diesel fuel and delivering it from locations many hundred and even thousands of kilometers away (at times the cost of delivery exceeded that of the fuel by several times).

Project activities involved converting boiler plants to the use of local renewable energy resources (wood waste, simply put). This made it possible to get rid of waste occupying large areas, decrease hazardous emissions, save sizeable funds for the local budgets and create new jobs. Simultaneously, not only the workers of the boiler plants, but other community members as well were trained in the basics of energy saving, rational use of local resources and creation of partnerships. Thus, the students of the Technology and Economics College in Varnavino underwent a course Small Business Creation and received official certificates.

The second phase was devoted to disseminating best practices to neighboring municipalities and other regions of the country through seminars, trainings, meetings and the mass media. A mobile exposition Povetluzhye devoted to the social/economic and environmental/cultural potential of the raion was created in Varnavinsky raion. It was displayed in five regions of the Russian Federation.

The Program attracted a vivid interest in many locations. Its team received requests for participation in seminars and conferences and information about the Program from 50 municipalities. Thus, it was decided to extend the second phase for another three months.

As soon as wood waste began to be used as fuel instead of coal and diesel fuel, the environmental situation improved significantly – greenhouse gas emissions decreased by almost half. The issue of fuel stealing (almost 15% of the delivered fuel was stolen) was also solved.

Local and interregional NGOs took an active part in project implementation (Povetluzhye Association in the Volga Region and Uragus Conservation Society and Northern Primorye Development Support Fund in Terneisky raion), thus demonstrating to the local authorities that conservation activists cannot only be critics and troublemakers, but reliable partners as well. NGOs were the first to act as a key connecting link between government, business and communities. They also ensured utmost openness of project activities and a broad dissemination of project results, which, in the end, helped raise additional funding from businesses and regional budgets.

Obviously, after the end of FSD funding, the new partnerships not only did not disintegrate, but began to more actively address critical issues related to local development, environmental protection and rational use of resources: in Varnavinsky raion increasing numbers of timber processing plants are becoming engaged in supplying fuel to boiler plants, and in Terneisky raion negotiations are under way between Terneiles LLC and the local administration on the further development of the local energy efficiency program.

Dissemination of Experience

In November 2008, these issues were discussed at a seminar Innovative Technologies and New Jobs for Rural Communities organized by FSD, Varnavinsky Raion Administration and Povetluzhye Association. The seminar was attended by officials from 12 municipal administrations from the Republic of Mari El, Vologda, Kirovskaya and Nizhny Novgorod oblasts, the staff of the Nature Saving Technology Center, an NGO from Nizhny Novgorod, representatives of business firms, energy efficiency experts from Dzerzhinsk Polytechnic University and lawyers and environmentalists from Moscow. The seminar participants visited a boiler plant in Mikhalenino, where a special

boiler was installed that works on wood waste. The materials of the seminar were used for preparing the mobile exhibition Povetluzhye.

In August 2009, in Plastun, a seminar Energy Efficiency and Jobs in Remote Rural Areas in the Russian Far East was organized by FSD and the Northern Primorye Development Support Fund. The participants in the seminar from Moscow, Yekaterinburg, Buryatia, Kemerovo, Nizhny Novgorod and Sakhalin oblasts and Primorsky and Khabarovsk krais discussed new jobs creation in their regions and shared experience in this sphere.

Much attention at the seminar was focused on the creation of new jobs in such sectors as tourism and the collection and processing of non-timber forest products for which funding from various sources may be used. It was noted that when using integrated approaches that involve creating new jobs in several places simultaneously, communities benefit by increased economic efficiency due to less dependence on seasonal factors and the macroeconomic situation.

The participants in the seminar became acquainted with the work of the new boilers in the local hospital, technical information related to the Program and plans for the nearest future.

Lessons Learned

In the course of implementing the Program its participants and organizers learned many valuable lessons. Following are just a few of them.

There is an obvious need to manage risks related to the possible shortage of wood waste. They may be mitigated by signing long-term contracts for the supply of wood waste from various locations (as has been done in Varnavinsky and Terneisky raions) and expanding the range of waste suitable for burning, in particular, by processing it with inexpensive shredders.

At the same time, the problem of unemployment among young professional community members may also be addressed if the new jobs are filled, in the first place, by local youth studying in large cities. For this, they should be engaged in community development and job creation projects (including jobs for themselves) at the phase of term papers and graduation papers.

This could become a strong incentive for their return home after receiving an education.

Project development and implementation should be preceded by a thorough “inventory” of local resources, an identification of local priorities, a study of community opinions and local features and possibilities for creating new jobs (for example, in the sphere of tourism, collection and processing of forest products and rational agricultural methods).

Key to success is the establishment of productive interaction among government, citizens, businesses

and NGOs and the promotion of multi-stakeholder participation.

Of special significance is the creation of an integrated results monitoring and assessment methodology.

There is a whole range of possibilities for creating jobs, including with the use of funds from the Federal Budget and a variety of government business support programs, but to translate them into reality requires closer cooperation with regional and local governments, businesses and NGOs.

“Free” Fuel

Production of energy from wood and wood processing waste is one of the most advantageous areas of development that is becoming more and more popular in Russia. Practically free fuel that used to be only a source of concern might become a factor of ensuring energy independence in forested areas of the country. This type of fuel is widespread, cheap, safe and economically feasible as a substitute for coal and diesel fuel.

Agencies concerned with timber processing in Archangelsk oblast came to the same conclusion. Recently, the Ministry of Regional Development considered a project presented by the Interdepartmental Working Group for Alternative Energy Sources that involves the use of low-grade wood and timber waste for the production of biofuel in Archangelsk oblast.

This project is aimed at building seven low-grade wood and wood waste processing factories and modernizing utility facilities by converting boiler plants from the use of coal, petroleum products and firewood to the use of timber processing waste, wood fuel granules (pellets) and briquettes. It is expected that the production lines will put out 35,000 t of solid biofuel a year. The total cost of equipment and construction is 2,116 million rubles. By modernizing existing and building new boiler plants and building small power stations, investment will amount to nearly 5,020 million rubles with a payback period of up to 7 years.

At present, the design and budget of this project are in the process of being elaborated. It will be implemented based on a public-private partnership

with the participation of large investors. The Ministry will provide assistance in preparing and conducting a tender for the selection of an investor.

Under this concept, a project for building and modernizing boiler plants with the aim of converting them to the use of biofuel will be carried out on concession terms. Currently 74% of resources (diesel fuel, coal, black oil) in the energy production system of this oblast are being delivered not only to large power and heating plants, but to hundreds of small boiler plants as well. Many of these have a high degree of depreciation and low efficiency.

To this end, the economic feasibility of two versions of boiler plant modernization was assessed: with the use of previously used fuel or with a full substitution of previously used fuel with new one. The calculations of the authors of the project showed that the second option was more effective. Thus, low-grade wood, of which there is a sizeable reserve in the region, may be used for the production of biofuel.

The project has already been approved by the Ministry where it was presented in the presence of potential investors. The head of the Forest Sector Department announced the amount of investment as 5 billion rubles. This project by its scope qualifies for support from the RF Investment Fund. As a result of a series of consultations it was planned that 39% of funds will be raised from the Investment Fund and 11% will be co-funding from the regional budget. The regional authorities are now searching for concessionaires.