

HOUSING CONDITIONS, HOUSING CONSTRUCTION AND PUBLIC UTILITIES

The post-Soviet reforms in the housing sector of Tajikistan have gone through four main stages. The first stage of reforms from 1992 to 1997 was the initial introduction of market relations in the hitherto centralized housing system. This involved mass housing privatization, a withdrawal of the State from direct housing production and decentralization of housing functions from the national to local governments. These changes led to contractions in the State housing budget, in the house-building industry and in the housing and public utility services.

The second stage from 1997 to 2002 involved housing activities to support recovery after the civil war. This period was characterized by low housing prices, deteriorating infrastructure and patchy legislative initiatives. Some international organizations and NGOs implemented housing-related projects, but had difficulty in sustaining or maintaining them.

The third stage from 2002 to 2007 was characterized by speculative private housing constructions, fuelled by remittances from labour migrants working in the Russian Federation. At this stage, housing developments were predominantly market led, leading to expensive housing developments and the spread of unauthorized housing construction, while the existing housing and infrastructure fell further into degradation due to limited maintenance. International organizations and NGOs focused on improving sustainability and scaling-up of their successful housing projects.

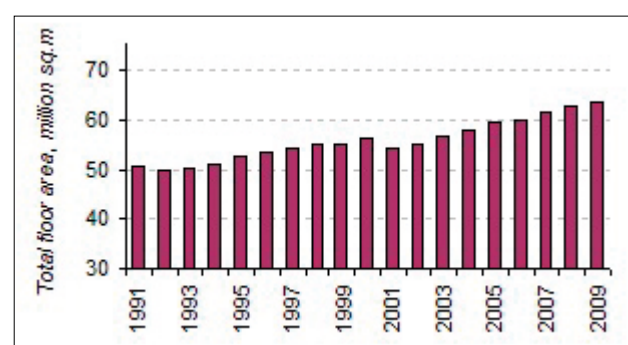
The last stage, since 2007, can be characterized by a slight increase in Government interventions in housing and cooperation with international donors and NGOs. A more strategic approach to the national housing policy has been taken and housing issues have been incorporated into the National Development Strategy and the Poverty Reduction Strategy Paper and housing legislation has been improved (see chapter III).

A. CONDITION OF THE EXISTING HOUSING STOCK

The official national statistics in Tajikistan concerning housing needs to be considered with caution, as the

reliability of data collection remains questionable. Yet, according to this statistical data, received during the mission, the Tajik housing stock grew slowly from 56.8 million square metres (m²) in 2003 to over 63 million m² in 2009 (figure 4), an increase of almost 12%. There had been no net increase in the previous period of 1997-2002.

Figure 4. Housing stock in Tajikistan, 1991–2009



Rural and urban housing stock account for 60% and 40%, respectively. About 25% of the population lives in multifamily housing, and 75% in single-family housing. There are 8,500 multifamily buildings, 40% of which are located in Dushanbe. Multifamily housing is diverse and includes different types of buildings depending on the period of their construction, such as the high-rise buildings of the 1980s and the preceding *khrushchevki* blocks of flats.

Since 1995, when the Law on Housing Privatization was approved, around 93% of the housing stock had been privatized by January 2010. Only around 7.5% of the total housing is public (see chapter III). Privatization revealed geographical and social variations in “housing wealth” and access to housing services. Many people live in overcrowded housing. The average per capita total floor area decreased from 9.4 m² in 1998 (which was already the lowest figure among the former Soviet Republics) to 8.6 m² in 2008, while the official per capita national standard is 12 m². For the purpose of comparison, in 2008, per capita total floor area in Kazakhstan was 17.9 m², in Kyrgyzstan 12.4 m², and in the Russian Federation 22 m².³¹ The highest 2008

³¹ Interstate Statistical Committee of the Commonwealth of Independent States, <http://www.cisstat.com>.

per capita total floor area was registered in Dushanbe (11.3 m²) and in the Sogd Oblast (10.3 m²). Today, the housing conditions of many families are deteriorating due to neglected maintenance and repair. By 2008, the decrepit state of multifamily housing was estimated to be around 40%³² (50–80 % of them in need of immediate renovation). Regarding single-family

assistance for those with housing needs, which now targets specific groups only (e.g. the disabled, persons with an illness and orphaned children). Even so, in 2007 only 5% of those on the housing waiting list improved their housing conditions.³⁴ In general housing demand significantly exceeds the supply especially in large cities.

Picture 3. Multifamily housing in need of upgrading



Source: UNECE.

housing, the majority were built without planning guidance and are usually in violation of seismic regulations.

Out of the total of 360,340 households in urban areas in 2007,³³ only 21,700 were registered on the housing waiting list — four times less than in 1991. Such a sharp decrease, despite the persistence of housing shortages, is due to a restructuring of State housing

B. HOUSING MAINTENANCE

In both urban and rural areas housing management is inadequate and there is a lack of access to basic utilities. In 1991, local governments were given the responsibility for control over housing maintenance and provision of utilities, but no accompanying funding or other mechanisms were provided.

The sector today is facing a number of challenges, namely: (a) the physical degradation of utility networks; (b) ineffective administrative mechanisms

³² Consumers' Union of Tajikistan (2010) "Background of Maintenance and Management in Residential Blocks". Dushanbe.

³³ State Committee on Statistics, Living Standards Survey in Tajikistan, 2007 — Household Characteristics.

³⁴ Interstate Statistical Committee of the Common Wealth of Independent States, <http://www.cisstat.com>.

guiding service delivery; (c) the lack of a strategic approach to setting tariffs; (d) the high proportion of poor households dependent on State support for housing services; (e) the low awareness of the needs and benefits of efficient use of resources; (f) unclear responsibilities over upkeep of and repairs to multifamily housing and utility networks between and inside multifamily houses (outside utility mains) or within communities in rural areas.

In 2002, a draft Concept for the Housing and Utility Sector Reform proposed a reform of the housing and utility services; however, as of January 2010 this draft concept was still under consideration. There is no strategy or comprehensive action plan at the moment for either housing maintenance or the utility sector. Budgetary funding for the sector is also limited.

Multifamily housing management

Multifamily estates built between the 1950s and the 1980s have not received enough maintenance and repairs for years and are generally characterized by poor conditions. According to the 1995 Law on Housing Privatization, the ownership of common

areas is also transferred to the owner of the dwelling. If the dwelling requires capital repair, the Government is obliged to do it before privatization or to pay compensation. The law on Apartment Building maintenance and Homeowners Associations, adopted in 2009 (see chapter III), concerns the common areas of multi apartments building, and states that homeowners can choose either to manage the common property and utilities by themselves through an assembly or homeowners association or can hire a management company. However, these formal provisions have often not worked in practice, as there have been no proper implementation institutions and funding. Furthermore, many new homeowners are not able to implement capital repairs at their own expense.

Between 2006 and 2007 four pilot projects to establish a legal entity in four multifamily estates to deal with management and day-to-day operations were implemented with the support of the European Commission and the Consumers' Union of Tajikistan. Since January 2010, however, only 28 homeowners' associations (8 in Dushanbe and 20 in Khujand) have been formed, because many homeowners did not want to take over the burden of major repairs

Picture 4. Multifamily housing in need of upgrading



Source: UNECE.

of the common areas in their multifamily houses. Since December 2009 the European Union has been funding a project, “Promoting Civil Participation in the Reform of Residential Building Maintenance and Management in Urban Areas”, to be implemented by the Consumers’ Union of Tajikistan in five cities — Dushanbe, Khujand, Chkalovsk, Kulob and Qurghon Teppa. The project is expected to promote effective and rational housing stock self-management, through awareness-raising and media campaigns, assistance in the de-monopolization of the housing service sector, and through capacity-building for housing management companies.

At present, the Government is discussing a number of instruments that could push forward the initiative on multifamily housing management, including building a clear legal and regulatory framework at the local level to support the formation of qualified housing management organizations, and the allocation of State funds for residents and housing management organizations to ensure long-term multifamily housing renovation and subsidized loans to homeowners.

C. PUBLIC UTILITIES

The utilities infrastructure was mainly constructed during Soviet times and the vast majority of it has either become inoperable, or is working at the limits of its capacity. Outdated infrastructure leads to huge losses, inefficiencies of operation, and has serious repercussions on the economy.

Water and sanitation

Water supply in general is irregular and of poor quality. Per capita water consumption in Dushanbe is 10 times more than the European average, due to inefficient and wasteful use of water and substantial losses of water through leaks.³⁵ The poor physical state of water redistribution networks (a 50%–60% depreciation rate) and inadequate water purification put the health of the population at risk. In 2007, out of 699 centralized water supply systems available in Tajikistan, 113 did not operate and 358 did not comply with sanitary norms³⁶.

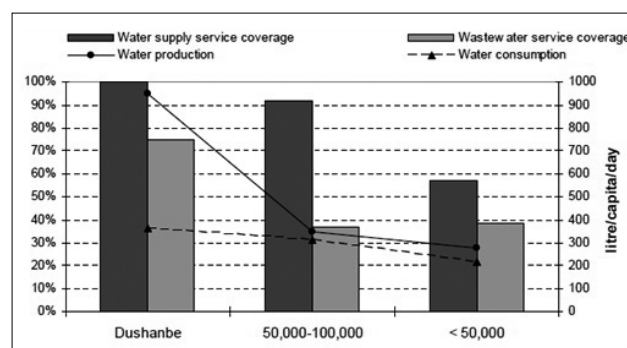
³⁵ Consumers’ Union of Tajikistan (2008) *Otchet Po Issledovaniyu Sferi Zhilishno-Kommunalnikh Uslug Gorodov Dushanbe I Khujand (Analytical Study on Housing and Utility Services in the Cities of Dushanbe and Khujand)*. Dushanbe.

³⁶ National development strategy of the Republic of Tajikistan for the period to 2015: <http://www.unpei.org/PDF/TAJ-National-Development-Strategy-en.pdf>.

Furthermore, an estimated 60% of water supply distribution networks and related infrastructure is either inoperable or does not meet the sanitary requirements.³⁷ This leads to an increased frequency and severity of outbreaks of water-related epidemics, such as hepatitis A, typhoid fever, dysentery and cholera, especially in rural areas. Enormous investment is required in this sector to improve the situation of water supply and sanitation in the country. The Water Sector Development Strategy of Tajikistan for 2006–2015 estimates that about \$1 billion is needed to improve the situation of water supply and sanitation in order to meet the Millennium Development Goals in these areas.

The situation of drinking water and sewage service supply differs considerably across different types of settlements. If in Dushanbe almost 100% of population is covered by the centralized water supply and about 75% have access to wastewater services, these figures fall to about 55% and 40% respectively for towns having population less than 50,000 (see figure 5).

Figure 5. Drinking water supply and wastewater service coverage (percentage); water production and consumption in litres/capita/day across different types of settlements



Source: Environmental Action Programme Task Force Water Utility Performance Indicator Data-base, Organization for Economic Cooperation and Development, 2006–2007.

The Government has tried to improve the urban and rural water supply by attracting donor support, as well as grants and loans from international institutions such as the World Bank, the Islamic Development Bank, the Swiss Agency for Development and Cooperation, the Asian Development Bank. For example, the World Bank has been implementing the Dushanbe Water Supply Project (2002) and the Second Water Supply

³⁷ Environmental Action Programme Task Force Water Utility Performance Indicator Database, Organization for Economic Cooperation and Development, 2006–2007

Project (2010) for the reconstruction of the water supply system, which has resulted in better service delivery in some parts of the city. Recently (April 2011) a new water purification system was launched in Dushanbe, which will provide nearly half of the city's population with clean drinking water, with a multimillion grant provided by the World Bank for the new system's equipment and rehabilitation of existing purification facilities in Dushanbe.

The Dushanbe districts of Ismoli Somoni, Firdawsi and Sino, which account for 40 per cent of the capital city's overall population, will be the beneficiaries of the new water purification system. The equipment to install the new water purification system was purchased in Germany and installed with the help of German specialists.³⁸

In 2005, the water supply system of Khujand, the second largest city in the country and the capital of Sogd Oblast, was modernized. Many of the distribution and pumping facilities were replaced, the fee collection rates and practices were improved and water meters installed throughout almost the entire city. This project, implemented with financial contributions from the European Bank of Reconstruction and Development (EBRD) and the Swiss State Secretariat for Economic Affairs, represents an example of good practices for possible replication in other towns.

Projects to improve the water supply in Dushanbe have brought positive outcomes, and the quality and availability of water has somewhat improved in recent years. However, given the needs of Dushanbe and the projected future development of the city after the approval of the new master plan, the amount of work to be done in this field is still enormous.

The recent construction boom that began in the city, and the construction of high-rise multifamily units, will further strain the existing inadequate infrastructure and the improvements made in recent years may be lost without further, considerable investment. The management systems of local utility companies need to be modernized; and the practices for collection of fees and tariff policies also need to be revised. In Dushanbe water meters are absent in multifamily units, and this leads to the wasting of water.

The situation with sewage systems operating in towns is even more urgent, as this sector has been considerably underinvested in. Most of the sewage

treatment facilities in the country are working at the limit of their capacity. The increasing population of towns puts additional stress on a very outdated sewage infrastructure.

There is a similar problem with the collection, storage and incineration of municipal solid waste. The existing system of waste collection is inadequate and cannot meet the needs of growing town populations. Some pilot projects with international assistance in smaller towns remain fragmented and lack plans for sustainability in the absence of a general strategy from the Government for the reform of this sector.

Electricity, natural gas and district heating

Households are responsible for around 40% of the overall electricity consumption in the Republic. In 2009, about 90% of the urban population had access to electricity. Access to electricity is based on the so-called "joining agreement" under which a new customer has no choice but to join the uniform standard agreement of the monopoly provider.³⁹ Although the relationship between the customer and the electricity provider with regard to service delivery is formalized, the responsibilities for upkeep of the elements of the local electricity network running between and within multifamily houses or within communities in rural areas remain unclear. Electricity providers tend to deal only with electricity networks up to electrical transformers. Cables running to houses or located inside multifamily houses remain a "no man's land", and these are the areas where accidents often happen. At the same time, there have been substantial losses of electricity due to the physical degradation of the utility grid, lack of housing maintenance, inadequate electricity redistribution within houses and underdeveloped metering.

The problem of insufficient electricity supply for the population has been very acute in Tajikistan since independence. The country has a serious deficit of electricity during the winter, when its hydropower plants are not producing adequate electricity to cover the needs of the country. The import of electricity from neighbouring States is also not stable for technical and political reasons. A combination of different factors led to the acute energy crisis of the winter of 2007/08. The energy sector needs modernization to reduce the considerable losses in transmission lines. As hydropower sector development has been considered one of the top priorities of the Government, the country has invested in the construction of high-

³⁸ Tajikistan Business Gateway: www.centralasianewswire.com

³⁹ The conditions of the agreement are checked by an anti-monopoly body and should be approved by the Government.

voltage transmission lines, which will be used to export electricity to neighbouring countries after the projected completion of the Rogun and other smaller-size hydropower plants. The State electricity company, *Barki Tojik*, is also investing in modernizing the existing intra-city distribution networks by rehabilitating substations, transformers and distribution lines.

Interest is also increasing in programmes for energy saving and energy efficiency. Presidential Decree No. 653 of 24 April 2009 on “Additional measures for economical use of energy” initiated the use of energy-efficient bulbs. The same decree also foresees the elaboration of State programmes for reducing energy losses and achieving energy independence in terms of electricity and natural gas in the medium term.

In 2009 about 30% of Tajik households had access to gas supply. By 2008, gas meters were installed in Dushanbe for about 70% of supplied households and 88% of supplied households in Khujand city were metered.⁴⁰ The country is importing almost all its natural gas from Uzbekistan and local production is sufficient only to cover the needs of a few smaller towns. As the prices of natural gas have risen sharply during the past five to six years, the country cannot afford adequate imports of gas mainly due to the inability of both businesses and the population to pay for it. The difficult situation with both electricity and natural gas supply, especially in smaller towns and rural areas, has forced the population to search for autonomous energy sources. Gasoline- or diesel-run generators were widely used as alternative electricity sources, while liquefied petroleum gas or compressed natural gas were used for heating, together with locally available wood and coal.

The electricity network is especially stressed during winter when the population, mainly in urban areas, is using electricity for heating. Dushanbe and other major towns had very well-developed district heating and district hot water supply systems during Soviet times. However, during the years of the civil war and the economic problems that followed, the large majority of those systems became inoperable due to lack of maintenance. Only about 10%–15% of multifamily units in Dushanbe are now being supplied with district heating and hot water during winter. The problems are both with the decrepit network and

infrastructure and with the deficit of fuel for the district heating plants, which work mainly on imported fuel oil and natural gas. Since the 1990s, there has been no investment in rehabilitation of the heating supply system, leading to these significant losses in the system. In 2009, access to central heating was provided to only ca. 17% of the population, predominantly in Dushanbe. In fact, the system needs almost 100% capital investment. Due to the lack of a properly functioning heating system, people have used alternative services to heat their houses such as coal and electricity. Today, almost 80% of residents in multifamily houses have dismantled radiators and hot water pipes. Therefore, while the rehabilitation of the district heating and hot water systems in urban areas would lead to a considerable decrease in the levels of the peak electricity demand during winter time, it would be extremely costly to achieve.

Since 1996, UNDP has been involved in community-based initiatives to develop basic infrastructure within the framework of the Poverty Reduction Strategy Paper, mainly in rural areas. The UNDP projects helped develop basic utility systems in some communities made up of 12 to 14 single-family houses. However, ensuring sustainability of these projects remains a difficult challenge. The capacities for self-organization among communities are different. There is a lack of specialists and persistent poverty in many rural communities. Nevertheless, there are some successful examples too. In 2008, UNDP assisted a rural community in establishing efficient long-term management of its water supply system. The village council established a formal structure and a collective investment fund for the long-term management of the provision of drinking water, heating and waste management services.⁴¹

D. THE HOUSING MARKET

Housing supply and demand

The housing construction industry (including the domestic production of building materials) remains weak. There are only two cement plants in Dushanbe, whose production lines are becoming obsolete and need to be modernized, and many building materials are imported. In the light of the limited funding and capacity of the domestic housing construction industry, the Government has promoted a better investment climate for foreign builders. Some Iranian, Turkish and Russian companies have shown interest in the construction of “elite” housing. Nevertheless, until now only one Russian company has built such

⁴⁰ CU (2008) *Otchet Po Issledovaniyu Sferi Zhilishno-Kommunalnikh Usług Gorodov Dushanbe I Khujand (Analytical Study on Housing and Utility Services in the Cities of Dushanbe and Khujand)*. Dushanbe.

⁴¹ Based on the interviews with a UNDP representative

housing, “Paytakht-80”, in central Dushanbe. Many large foreign housing construction companies are believed to be reluctant to enter the Tajik housing construction market, which lacks proper regulations, especially seismic regulations, and thereby puts their reputations at risk. Also, many skilled Tajiks migrate to work in the construction sector of neighbouring countries.

The official housing market is dominated by demand from wealthy households. There are no mechanisms that could stimulate effective demand from the rest of the population, despite the annual natural growth in population of 2%–3%. According to the State Statistical Committee, between 2003 and 2009 there was almost a 12% increase in the population (from 6.573 million in 2003 to 7.374 million by 2010).

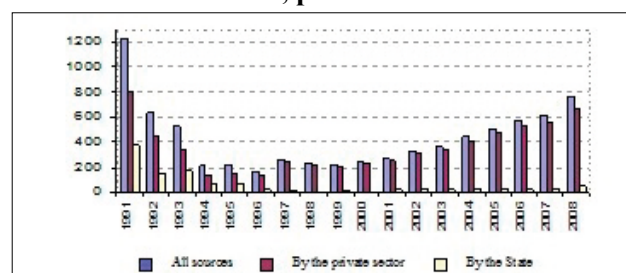
Picture 5. New constructions in Dushanbe



Source: UNECE.

Nevertheless, housing output in Tajikistan has been growing since 2003. Housing production more than doubled over the period 2003–2008 (from 364.8 thousand m² to almost 763 thousand m²); this was, however, 1.6 times less than in 1991 (see figure 6). In urban areas, housing construction is mainly led by the private sector and aimed at wealthy customers, while in rural areas housing output is made up of self-built single-family housing. If in 1991 private housing construction accounted for about 65% of the total housing output, by the end of 2008 that proportion had grown to almost 90%. On the same note, house building by State organizations dropped from 35% to 6% during the same period (Cisstat). Housing construction has also been geographically concentrated.

Figure 6. Housing output in Tajikistan from 1991–2008, per thousand m²



Source: State Statistical Committee (2010)

Housing prices

In the early 1990s, due to a mass out-migration of the Russian population, the civil war and the

subsequent economic crisis, housing in Tajikistan was relatively affordable, despite the fact that there was practically no housing construction. However, the situation changed during the period 2001–2010 and housing prices increased manifold due to the lack of construction and rural-to-urban migration. In January 2010, housing prices in Dushanbe ranged between \$300 and \$2,000 per m², depending on quality, layout, and location, and rents were between \$250 and \$2,000 per month.⁴² Nevertheless, today housing prices in Tajikistan remain the lowest among the former Soviet countries.

Affordability

In general, there are no housing affordability indicators at the national level that could be used as one of the mechanisms to promote affordable housing. Despite widespread poverty, social support is undergoing monetization and is mainly targeting the most vulnerable population. The challenges of housing affordability in Dushanbe can be demonstrated by considering some examples of the relationship between household structure, income and house prices.

In January 2010 a leading construction company was selling a 55 m² two-bedroom flats in a 12-storey apartment building to be finalized in September 2010. The flats were offered to a household of two earners at \$33,000 on the condition that 50% (or \$15,500) was paid upfront and the remaining 50% was paid in instalments as the work advanced. Using the benchmark that monthly payments for housing should not exceed 30% of household monthly income, it appears that decent housing remains unaffordable for the average household, given that the current annual wage of a household of two earners is \$1,728 (the average monthly per capita wage in January 2010 was \$72). Therefore, the household would need at least 30 years to accumulate the required 50% of payment for a flat ($\$15,500/\$518 = 29.9$ years). Purchasing housing through municipal housing programmes is also unaffordable for many households. For example, a similar flat of 55 m² offered under a similar payment agreement would be priced at construction cost between \$400–\$450 per m². The total flat price would then be at \$22,000–\$24,750. The required 50% prepayment would be between \$11,000 and \$12,375, which is the equivalent of 21 to 24 years of savings for the average household.

Fees for housing maintenance are also high compared

⁴² Vestnik Tajikistana (January, 2010), *Tseni na zhilye vverkh ili vniz*. Nedvizhimost N 008. Dushanbe.

with the actual amount needed to address long-term negligence in housing management and repair. In order to receive housing management and repair services, each homeowner makes an agreement with the municipal housing management organization (in major cities) or with representatives of the State Unitary Enterprise on Housing and Utility Services. Between 2005 and 2008, annual per capita expenses for housing services almost doubled: from about \$5 in 2005 to about \$11 in 2008.

Public utilities provided for the population include: electricity, natural gas, hot and cold water, sewerage and heating. Due to physical degradation of the utility systems, there have been substantial losses of resources through leaks. Such a situation affects the supply side of service provision, as many citizens refuse to pay for low quality and overpriced services. At the same time, the hitherto universal provision of utility services during the Soviet era has had a negative effect on the consumption habits of the population today, as many cannot get used to limiting the use of resources.

During the fact-finding mission, the following example was provided. A family with two earners and two children living in Dushanbe could spend between \$10 and \$15 dollars per month on its electricity bill. The household does not have central heating (like many other families in Dushanbe), and therefore does not pay for such services. Like many other residents, the family does not have access to gas, since gas supplies from Uzbekistan have become limited in recent years. Payment for water is usually very low, amounting to \$30–\$40 per year, with people in rural areas often just collecting water free of charge from a standpipe in the street. Therefore the total payment for utility services by the household would be between \$13 and \$18 per month. Given a total of \$144 in wages for the family per month, utility payments would account for 11% of the total family budget. In many countries, such a family would qualify for social support.

E. ENERGY EFFICIENCY

The energy efficiency of new and existing buildings has been on the Government agenda since the adoption in 2002 of the “Concept for the Development of the Fuel and Energy Sector for the period 2003–2015”. The document proposes improving the heat insulation of the outer shell of buildings for effective savings in building maintenance and in fuel and energy resources. The momentum for energy efficiency in buildings was regained with the President’s address to Parliament in April 2009, in which the need for energy-efficient

technologies in building design, construction, maintenance and renovation was highlighted. In general, energy efficiency developments remain patchy, although the Agency for Construction was recently entrusted with the development of a national programme on energy-efficient housing the first quarter of 2010. The programme was intended to include a broad range of actions, such as research, design, funding, tariff regulation, etc.

Heat losses through buildings' exterior walls account for 20%–60 % of the overall heat consumption; at the same time, up to 95% of non-productive heat losses occur as a result of poor operation of buildings, amenities and utility systems. Multilayered walling, made of effective heat-insulation materials, has been suggested as part of the solution. Also, new construction norms and regulations regarding insulation for buildings are currently being developed. A number of other measures have been suggested to

improve insulation in buildings, such as: (1) making improvements in spatial arrangements and layout design, (2) establishing new regulations on the use of energy-efficient building envelopes, and (3) developing a new evaluation system for fuel and energy resource use in buildings.

A new system, called “energy passport for buildings”, is intended to be widely used in the near future and to be submitted from the very beginning in the project design stage. Moreover, the State intends to promote and to finance research and development of new energy-saving technologies for use in the construction and reconstruction of residential buildings.

The use of renewable energy sources has also been explored. Some recent projects demonstrate that the use of solar energy converters can be cost-efficient. For example, the use of solar converters for hot water supply and emergency lighting in entrances are

Box 2. Study on heat supply and improving energy efficiency in multifamily housing

About 14% of the overall population in the Republic lives in five major cities — Dushanbe, Khujand, Kurgan-Tube, Kulyab and Chkalovsk — and consumes more than 40% of the electric energy. In terms of natural gas consumption, the residents of Dushanbe city alone consume up to one third of the overall gas consumption of the Tajik population..

The study of the Consumers' Union of Tajikistan identified a number of challenges in the area of heat supply: (a) the need for almost 100% capital investment to restore the system; (b) ineffective methods of heat supply; (c) unclear responsibilities, including for the targeting vulnerable groups; (d) low quality of utility services; and (e) the need for innovative technical solutions.

The study also suggested a number of solutions. For example, for heat supply, it proposes the combination of centralized and decentralized (independent) systems depending on the particular technical and economic situation. Regarding the choice of heat supply systems, a number of alternatives were suggested and already exist in Tajikistan, such as: (a) electric power due to the recent plan to develop additional hydropower resources, which would allow the application of induction heater and heat pump technologies; (b) solar and wind power, as complementary energy sources for warming houses and water; (c) coal, as an additional resource (Tajikistan has substantial coal reserves); (d) natural gas (although gas resources are very limited in the Republic and need to be imported); and (e) liquid fuel in emergency situations, as Tajikistan lacks sufficient reserves of this type of fuel.

With regard to energy saving, two approaches were suggested: energy use management and reduction of unnecessary resource losses. Energy use management involves modernization of individual heating plants, the installation of thermostatic regulators for radiators, etc. Reduction of unnecessary losses can be achieved through external strengthening of walling, restoring sealing of seams between the panels and hydrophobization of walls; winterization of structural elements of attics, mechanical rooms and basements; insulation of heat and hot water supply pipelines; installation of radiator reflectors; and refurbishing of building entrances and glazing.

In terms of strategic planning of the public budget and external support, the following aspects were highlighted: (a) the need to allocate public budget and/or foreign assistance supported by reliable information, legislation, taxation (b) institutional support; and (c) the need to raise the efficiency of homeowners' energy use.

Finally, the study suggested three strategic options to improve energy efficiency and reduce the energy deficit. The first involves the formulation and implementation of a national comprehensive programme including both heat supply and energy saving components and the development of legal mechanisms to implement the programme. The programme would provide targeted funding for private and local government initiatives to restore and develop the heat supply system in Tajik cities, loan-based funding for energy-saving technical solutions for the population and homeowners' associations, and raising awareness of the population through the mass media.

The second option proposes the formulation and development of a national programme involving only an energy saving component, through the improvement of energy efficiency in housing and public buildings and would require less expenditure. The third and final option envisages only the development of a heat supply system that would address the unacceptable situation of electrical energy being overused for heating needs.

being considered for a 12-storey residential building in Dushanbe. The use of heat pumps, together with solar energy converters, underground thermal water energy, etc. is also expected to accelerate the process of the substitution of fossil fuel and hydroelectric energy sources. It is believed that heat pumps could substitute for electrical heating in single-family houses, equipment in multifamily houses could utilize liquid and hard fuel, boiler-houses and district heating systems.

A number of small community-based projects for energy efficiency in housing have been carried out in Tajikistan by some international organizations as part of the poverty alleviation programme and, recently, the Consumers' Union of Tajikistan has completed an important analytical study on heat supply and energy efficiency in multifamily housing (box 2). The analytical study was finalized in February 2009 as part of the Programme on the Development of Public Policy in Tajikistan and the Government Programme on the Promotion of Effective Consumer Policy in the Energy Sector of Tajikistan. The latter programme is being implemented by the Consumers' Union of Tajikistan and financed by the Delegation of the European Commission to Tajikistan. The study investigated what financial and technical mechanisms were available to improve heat supply and energy efficiency in multifamily houses in Tajikistan.

F. SELF-BUILD HOUSING

In 2008, self-built single-family housing made up almost 87%⁴³ of the total housing output in Tajikistan. A growing trend towards self-help construction is driven by limited opportunities for many households to improve their housing situation. The Tajik family by tradition lives in a large detached single-family house with a well-protected and isolated garden. Self-help includes the conceptualization, design and building of a home through undertaking all or some of the activities directly, or indirectly, through subcontracting a building organization.

In Tajik rural areas, there is a community tradition of families assisting each other with the construction of houses. As a rule, there is a sort of foreman in each residential area with house building knowledge and skills who can be consulted by the other residents in building their own houses.⁴⁴ Therefore, many rural

areas have a more or less homogeneous residential pattern, in contrast to self-build in residential areas in large cities which consist of fenced single-family houses with varying architectural styles.

Many self-built houses in both rural and urban areas are not in conformity with the formal building regulations, mainly due to the residents' limited financial resources, but also due to the inadequacy of knowledge and training on building regulations. Many self-built houses in rural areas do not provide good quality and safe accommodation for the inhabitants. The houses are made of stone and mud bricks that are found or produced locally to substitute for other expensive building materials. The existing building norms do not have provisions on how to use local building materials and at the same time to be safe. While standard architectural design for a typical rural single-family house has recently been developed, it does not take into account the use of local resources and social vulnerability (lack of access to the required materials), and hence remains inadequate for use in many communities. In some urban areas, self-build housing is being supported by the municipality. For example, in Dushanbe, a number of recent self-built housing projects in Vostochniye Kholmi area have been supported through funding and building of the houses' foundations at the expense of the municipality.

Since 1997, a number of international organizations have been involved in promoting community-based self-help housing initiatives and successful examples have now been replicated throughout the country. For example, the World Bank has implemented the "Shelter and House Rehabilitation Programme"⁴⁵ that supported self-help housing initiatives of returning families in the areas most devastated by the civil war — Bokhtar, Vakhsh, Kolkhozabad, Kabodien and Shaartuz districts in the Khatlon Oblast. The programme supported essential structural repairs (walls and roofs) by providing roofing materials (timber, nails, tiles) as well as through the distribution of food for local builders. The programme also promoted the use of innovative roofing technologies such as fibre-cement tiles. Based on that success and lessons learned from its previous programmes, the World Bank has implemented a number of similar projects that have supported low income families' initiatives to improve their living conditions on a sustainable basis.

⁴³ Data provided by the Statistical Committee of the Republic of Tajikistan

⁴⁴ As was explained by experts at the State Agency of Architecture and Construction during the research mission to the country

⁴⁵ World Bank (1997), Staff Appraisal Report. Republic of Tajikistan. Pilot Poverty Alleviation Project. New York.

The effective outcomes of the World Bank projects involved: the establishment of the National Social Investment Fund of Tajikistan;⁴⁶ securing funding commitments from the project counterparts, capacity-building in effective management of the Social Investment Fund; securing community involvement in procurement; and better targeting of the vulnerable population by building up an evidence base through local and regional surveys, and through the establishment of monitoring and assessment procedures.

The following lessons were learned from the projects: (a) the relevance of social funds in maximizing the effect of the development impact by focusing on isolated communities, improving their capacity, especially of those in post-conflict situations; (b) the need to sustain community social infrastructure projects by incorporating them in local government development strategies and by coordinating activities with line ministries; and (c) the need to align capital investments with capacity-building, testing, documenting and disseminating innovative good practices, analysis and knowledge sharing to maximize project outcomes.

Due to decrepit and overcrowded multifamily housing or abandoned buildings, HFHT⁴⁷ has also been working, since 1999, on a range of community-based housing projects. By 2010, around 530 housing interventions with the assistance of HFHT had been completed. HFHT works in partnership with both local and international NGOs and local and national governments. Many HFHT projects have been piloted throughout Tajikistan and HFHT has plans for scaling-up the successful initiatives. Three areas of HFHT interventions can be identified: (a) the application of innovative, low cost technology with sustainable “green” materials; (b) the use of appropriate solutions, which match the needs of the local population; and (c) helping some of the poorest people access clean, safe drinking water. One of the recent successful projects of HFHT has been the renovation of a half-finished nine-storey multifamily house in partnership with Khujand State University.⁴⁸ The completion of this 13-year-old building provided 52 homes for qualifying faculty and staff families. Following the

⁴⁶ A ‘demand-driven funding mechanism to finance community-based initiatives in rehabilitation or restoration of small-scale social and economic infrastructure and services in poor communities’

⁴⁷ The Tajikistan arm of the not-for-profit international organization.

⁴⁸ Habitat for Humanity Tajikistan (2007), *Rising from Ruins*, Habitat World. Budapest.

agreement, the University made its contribution towards property (an incomplete building) and a \$60,000 investment in infrastructure works. HFHT then invested \$250,000 and provided its expertise in renovation, coordinating the work with the relevant governmental agencies and utility departments. The outcome of the project has been the finishing of the nine-storey multifamily building in two phases, with decent quality and affordable apartments purchased by families for \$4,630. Specific mechanisms HFHT used to implement the project included the selection of families by a joint committee of HFHT staff and university officials; the contribution by a selected family of a 10% down payment, 500 sweat-equity hours working during the renovation process and making a pledge to pay the mortgage over the following eight-year period.

G. HOUSING AND NATURAL DISASTERS

Natural disasters such as earthquakes, flooding and mudslides affect the country frequently. In fact, about 74% of the population of 7 million in Tajikistan lives in 8- to 9-magnitude earthquake zones (Richter scale) and about 26% in 7-magnitude zones. In 2007, an earthquake severely damaged 19 villages, 1,484 homes and left more than 15,000 people homeless. The earthquake on 2 January 2010 severely hit 4 villages, affected 1,019 houses (6,145 people), with 98 houses being completely destroyed and 921 houses in need of repair.⁴⁹

Many existing and newly built buildings and amenities do not meet modern seismic regulations for a number of reasons, such as: (a) the deformation of many buildings built on soft (collapsing) soil and without any preparation of the foundation; (b) damage to buildings’ structural elements as a result of previous regular 3- to 6-magnitude earthquakes (Medvedev-Sponheuer-Karnik scale); (c) inadequate maintenance; and (d) the widespread violation of construction regulations.

If, in the Soviet era, the control over compliance with seismic norms was strict, it has been practically lost in recent years. Today, there is a big gap between formal regulations and their practical application, which has serious social and economic implications. Many single-family houses in rural areas are built without taking into account building regulations because many households cannot afford to buy regulated building materials (bricks and cement). This means that their houses suffer most in natural disasters. There are only two cement factories in the Republic,

⁴⁹ Agency for Construction and Architecture (2010)

Picture 6. International and local experts studying landslide damages



Source: UNECE.

and both are in Dushanbe. Remote communities can rarely afford the cost of buying and transporting the required building materials from the capital and no affordable alternatives are provided for. Therefore, most houses are made of locally found cracked stones and clay with weak construction elements.

Rural communities at risk of natural disasters have the opportunity to move from these areas through the so-called “ecological migration” and “voluntary migration”⁵⁰ processes. Since 2009 such households receive subsidized loans of 3,000 somoni (approximately \$682), including 50% from the State as a free-of-charge down payment, and with the remaining 50% to be repaid within the following

⁵⁰ “Ecological migration” and “voluntary migration” are the terms used in Tajikistan to define the relocation process. The first one means compulsory resettlement from disaster-prone areas and the second relates to voluntary departures from mountain areas.

two to three years. In addition, each member of these households receives financial support of 50 to 100 somoni. Many households in disaster-prone areas, however, do not want to move out of the areas where they have long lived. In some cases, the resettled households return to the areas they left, mainly for financial reasons. In fact, it is rather difficult for many resettled families to build a house for the sum allocated (the construction of a new house would require around \$5,000).

Some government institutions dealing with house building regulations in Tajikistan have only recently initiated discussions on how to build safely from local materials. For example, the Institute of Earthquake Engineering and Seismology has a tentative plan to review in 2011 the available local resources that can be later added to the Building Code.

The State Agency “Giprostroy” has recently designed standard three- and four-bedroom houses

for the victims of the Vanj district earthquake. The estimated cost of these projects is 50,000 somoni each (or \$11,500), which is quite high for the average household. A number of disaster risk management initiatives have also been implemented by some international organizations with the involvement of the relevant local and national authorities and communities. For example, UNDP together with a local NGO, PMP International, has started seismic vulnerability assessment of residential buildings in Dushanbe. Vulnerability data have been collected for

2,290 residential buildings (higher than two storeys). Also, earthquake scenarios have been developed for Dushanbe (only for residential buildings) and several workshops with city authorities have been conducted in order to raise awareness about earthquake vulnerability. In addition, HFHT and the Institute of Seismology have developed a “mulberry branch” building method to strengthen houses before earthquakes occur. To date, HFHT has built, renovated, and reinforced over 850 homes in earthquake-affected communities.

Picture 7. Houses constructed by the Government for the victims of landslides, Vanj district



Source: UNECE.