UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

TERMS OF REFERENCE

INDEPENDENT TERMINAL EVALUATION

UNIDO project "Promoting community level job creation and income generating activities through the development of cost-effective building materials production in Kyrgyzstan"

UNIDO Project No: 140116

Time period: 2014-2017

August 2017

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BACKGROUND AND CONTEXT

PROJECT FACTSHEET

Project Title	Promoting community level job creation and income generating activities through the development of cost-effective building materials production in Kyrgyzstan
UNIDO Project ID	140116
Region	East Europe
Country(ies)	Kyrgyzstan
Implementing agency(ies)	UNIDO
Executing partner(s)	
Project implementation start date	9 October 2014
Donor(s):	Russian Federation
Actual implementation end date	Original implementation end dated: 31 August 2017 Extended till 31 March 2018
Project Budget	
Total co-financing at design (cash and in-kind)	Cash: USD 2,000,000 (including support costs of 13%) In-kind:
Materialized co-financing at project completion (cash and in -kind)	
Planned terminal evaluation date	January-February 2018

(Source: Project document)

BACKGROUND

The Kyrgyz Republic (hereinafter referred to as "Kyrgyzstan") is a landlocked country in Central Asia with a population of 5.7 million1. Kyrgyzstan is geographically prone to multiple low-to-medium-level disasters: earthquakes, landslides and heavy snowfall, as well as floods.

Since its independence in 1991, the economy and public services have deteriorated drastically. After a political and social upheaval, a number of reforms have aimed to restore economic and social stability as well as address shortcomings in public governance. Kyrgyzstan faces additional challenges associated with sweeping changes in the global economy owing to its reliance on one gold mine, Kumtor, which accounts for over 10% of Gross Domestic Product (GDP), and on worker remittances, equivalent to about 30% of GDP spanning 2011-15.2

[1] Government of the Kyrgyz Republic and United Nations Development Assistance Framework 2018-2022.
[2] Available at: http://www.worldbank.org/en/country/kyrgyzrepublic/overview#1 (28/02/2017)

Kyrgyzstan is among the few lower-middle-income countries in the region of Europe and Central Asia, with its per capita Gross National Income (GNI) of US$1,170 in 2015. The poverty rate (measured at US$2.5/day) increased by 1.4% to 30.6% of the population in 2015 due to weak economic growth and lower remittance inflows.3 Wide regional development disparities and income inequalities undermine the country's progress.

Industry is the second largest sector of the Kyrgyz economy providing some 10% of employment, following retail and wholesale trade; it consists of manufacturing, energy and water supply, as well as mining. However, the share of manufacturing in GDP is declining due to a slowdown in gold production at Kumtor, while the fall in industrial employment is primarily explained by a significant reduction in the number of workers in the garment and food industries, respectively.4 Agriculture remains an important sector and source of 32% of total employment in 2014.

Housing sector

The Kyrgyz Republic has undergone major changes in the housing sector since its independence in 1991, including state withdrawal from direct housing provision, decentralization of housing functions to local government, mass housing privatization and increased involvement of the private sector in housing construction5. A UNECE report on the housing sector (2010) identified the high poverty rate as one of the major reasons for inadequate housing. Moreover, mass rural-to-urban migration and natural population growth in the late 2000's increased pressures on urban housing.

Restructuring in the housing sector was followed by a sharp reduction in housing construction and a deterioration of living standards, as well as an increase of construction costs due to a declining building-material industry. Low income households, especially in rural areas, undertake housing renovation works themselves due to limited financial resources and are unable to purchase costly construction materials[6]. Most of the existing housing stock was built during the Soviet era and is in need of repair. Only 40 per cent of rural households have access to running water and 40 per cent are linked to public sewerage systems. Urban areas are in a better situation; 70 per cent have access to running water and sewerage systems, but most buildings are also in need of renovation[7].

The 2007 Country Development Strategy for 2007-2010, proposed a reorientation of housing policy and identified affordable housing as a priority. However, due to the lack of a comprehensive institutional framework and insufficient financial infrastructure, the Government failed to address the country's housing problems[8].

Further aggravation of the housing issue took place in April and June 2010 mainly due to unrest in South Kyrgyzstan that destroyed 1,900 houses. The conflict tore apart cities and their surrounding areas in the provinces of Osh and Jalalabad[9]. In the semi-formal settlements that arose as a result of the conflict and migration movements, houses are built using discarded building material. Since no infrastructure for residential use is available in these settlements, people live without electricity or water supply. While some settlements resemble simple

[3] Available at: http://www.worldbank.org/en/country/kyrgyzrepublic/overview#3 (28/02/2017)
[4] Piga, G., Novovic, T. and Mogileskii, R. (2016) Common Country Assessment for the Kyrgyz Republic.
[5] UNECE, The Country Profile for Housing Sector of Kyrgyzstan, 2010.
[6] Swiss Agency for Development and Cooperation, Housing Microfinance Advisory Services Project. Accessed on 4 February 2014.
[7] UNECE, The Country Profile for Housing Sector of Kyrgyzstan, 2010.
[8] Ibid.
[9] Agency for Technical Cooperation and Development (ACTED), "Kyrgyzstan: one year after the violence", 9 June 2011.

residential areas with brick houses, others are an agglomeration of one-room huts accommodating entire families. During harsh winters, the huts are heated with coal ovens and insulated with plastic bags that close the windows and the partly open roof.

In response to the housing crisis facing the country, in 2001, the Government introduced a State Programme of housing construction until 2010. Similarly, in 2007 a National Programme of housing construction for 2008-2010 was approved by the Government. However, the goals of both programmes have not been achieved and, in 2008, housing construction decreased significantly[10].

Irrigation and drainage system development issues

In 2005, irrigation, which is vital for agriculture, covered an estimated area of 1,021,400 ha (full control irrigation). The irrigation system in rural areas of Kyrgyzstan, particularly in the mountainous regions, is mainly based on gravity-flow systems constructed in the late 19th century, although some were subsequently upgraded. During the Soviet period, responsibility for water distribution and maintenance of canals was the responsibility of collectivized landholdings and organized workers – "Kolkhozes" (collective farms) and "Sovkhozes" (state farms).

The irrigation system has undergone several upheavals in recent decades. After the collapse of the Soviet Union, land was redistributed[11] and in the early 1990s, the irrigation system was affected by the difficult transition and the lack of government and farmers' capacity to cover the operation and maintenance (O&M) costs of irrigation schemes. This resulted in a rapid deterioration of the water supply infrastructure, including hydraulic structures, dams, head-works and canals. As a result, the area covered by irrigation was drastically reduced and became rain-fed because of high prices of electricity and spare parts for irrigation equipment. All equipment for the irrigation system was produced in the Russian Federation[12]. The deterioration of higher-order irrigation systems, coupled with a shortage of finance and professional capabilities to adequately address the challenges and develop a new irrigation system, increasingly harmed the agricultural sector.

Currently, the main systems, particularly those downstream of large storage dams are well maintained. The distribution system, though, is generally poorly designed, built and maintained. Distribution efficiency is estimated at 55 per cent, mainly due to the considerable seepage and leakage losses, Irrigation and drainage network in Kyrgyz Republic comprises 12,835 km of canals, of which 82 per cent are earthen, 17 per cent concrete and 1 per cent pipes. The irrigation schemes are subdivided according to technical features as follows:

- Engineered irrigation scheme (40.2 per cent of the area): water-inlet structures on rivers that provide silt protection; the canals are lined.
- Semi-engineered schemes (34.4 per cent): water-inlet structures, but canals are only partly lined and partly equipped with water distribution structures.
- Non-engineered schemes (25.4 per cent): no water-inlets, and canals are not equipped with water distribution structures and are not lined.

According to the FAO, salinity and drainage problems in Kyrgyzstan are likely to increase in the upcoming years, while the Government is very restricted financially to address the issue. The main institutions involved in water resources, irrigation and drainage planning and

[10] State Programme on Affordable housing in Kyrgyz Republic for 2012-2014

[11] Joe Hill, "Farmer managed irrigation systems in the Alai (Kyrgyzstan) and Pamir (Tajikistan) mountains", Discussion Paper 1343, Global Water Forum, November 2013.

[12] FAO Water Reports, Irrigation in Central Asia in figures: AQUASTAT Survey-2012.

development, the Ministry of Water Resources/Economy and the Ministry of Agriculture are unlikely to be able to maintain and operate the existing drainage system effectively, nor improve or extend it. Most drainage and salinity problems are in the northern part of the country, in the Chui province[13].

The current legal framework for water management in Kyrgyzstan is elaborate, and the management of most secondary canals was transferred to the newly formed Water Users' Associations (WUAs). Formalization of the WUAs was promoted by international donors, including the World Bank and the Asian Development Bank. WUAs were established at the local level to distribute water, maintain field channels and to collect the newly introduced irrigation service fees. The main functions of WUAs are O&M of the on-farm irrigation system, water distribution, and dispute resolution. However, the capacities of WUAs lag behind. Under the influence of donors, the Government wants to expand the role of WUAs to also cover O&M that remains under the responsibility of the Government[14].

Building materials sector

The building materials sector constitutes around 6 per cent of GDP. Activities of enterprises in the sector are mainly based on local raw material resources. Export-oriented products in this sector include cement, sheet glass, walling and facing tiles made of natural stone. Inflows of FDI and local investment facilitated the development of enterprises focusing on the production of import-substituting building materials such as cement, fire bricks, polystyrene concrete, dry concrete mix, and others.

Kyrgyzstan has natural deposits of raw materials that partially meet the needs of the building materials sector. According to the National Sustainable Development Strategy, locally available raw materials are used in three cement plants – the Kant Cement Plant with a capacity of cement production of about 1 million tons per year, LLC "Tehnolin" with a capacity of about 300 thousand tons, and the Kurment Plant with a production capacity of 70 thousand tons. The building materials industry also includes a number of brick factories and quarries for the extraction of sand and gravel, loam, clay, limestone, basalt and gypsum[15].

Since 2006, the building materials sector has experienced a certain degree of stabilization. Currently, about 200 enterprises are engaged in the production of building materials, employing 10,000 people. From 2010, an upward trend in building materials output was observed, mainly attributed to the development of new capacities of cement production, and the launch of sheet glass production in 2012. The modernization of existing, and the establishment of new, building materials enterprises are supported by domestic and foreign investments[16].

Currently, the building materials sector of Kyrgyzstan faces several challenges in terms of inefficient management. Due to a lack of financing, the Government is unable to conduct periodic inspections and provide licensing services, leading to unsustainable use of resources and unavailability of reliable sources of construction materials.

Disaster risk management

[13] Food and Agriculture Organization of the United Nations, http://www.fao.org/docrep/w4356e/w4356e0h.htm
[14] IFAD, Water users Associations in the NEN Region: IFAD interventions and overall dynamics, October 2012.
[15] Ibid.
[16] WTO, Trade Policy Review, Kyrgyz Republic, October 2013.

The Kyrgyz Republic is prone to multiple low to medium-level disasters due to its mountainous landscape and location in a highly active seismic zone. The country is affected by earthquakes, landslides, mudflows, avalanches and floods, as well as heavy winter snowfall. There are around 14,000 hazard-prone sites. On average, natural disasters cause approximately USD 30–35 million of damage annually, but the Government's annual allocation for disaster response and risk reduction does not exceed USD 6 million[17].

Frequent earthquakes, landslides, heavy snowfall, as well as floods partially caused by deteriorated irrigation water supply system, hamper Government efforts to reconstruct the housing and irrigation systems in the country, due to lack of financing and unavailability of affordable construction materials.

MAIN CHALLENGES

Despite the efforts of the Kyrgyz Government, limited progress has been achieved in addressing the challenges of both *affordable housing* and the *rehabilitation of irrigation systems*, especially in rural areas.

The lack of **cost-effective housing** remains a severe problem for the local population, negatively impacting quality of life and access to basic facilities. Since centralized construction of housing decreased significantly, there is little infrastructure for residential use, with most existing housing requiring repair. Low income households, especially in rural areas, undertake housing renovation work themselves due to limited financial resources and are unable to purchase costly construction materials. The shortage of low-cost building materials negatively affects the availability of affordable housing, particularly for the low-income population in semi-formal settlements. While some semi-formal settlements resemble simple residential areas with brick houses, others constitute an agglomeration of settlements built using discarded building materials.

Deficient low-cost construction materials also hamper timely reconstruction and repair work of **irrigation canals and drainage systems**, especially in rural areas. The irrigation system in Kyrgyzstan faces several challenges related to secondary salinization, a lack of drainage, waterlogging and erosion that are mainly caused by the low efficiency of irrigation networks due to poor maintenance, deterioration of drainage network and a lack of financial and technical resources to run rehabilitation works[18].

As a result of the technical consultations held with the project donor (the Russian Federation), it was requested to integrate a component addressing the country's needs in the rehabilitation of the water irrigation systems to the current project proposal on "Promoting community level job creation and income generating activities through the development of cost-effective building materials production in Kyrgyzstan".

Hence, the potential of the country's building material sector to address the challenges of affordable housing and rehabilitation of irrigation and drainage systems is not fully employed. The local construction, manufacturing and, indirectly, agricultural sectors face the following constraints:

- Severe shortages of low-cost construction materials;
- Lack of access to energy-efficient and environment-friendly material manufacturing technologies;

[17] World Bank, 2013.

[18] UNCCD, Impacts from sustainable land management, case study – Kyrgyzstan.

- Shortage of adaptable technologies based on local resources of materials and manpower;
- Insufficient institutional support for promoting cost-effective technologies and investment in the material manufacturing sector;
- Unexploited potential for management of wastes/residues from agriculture and industry;
- Lack of employment opportunities leading to poverty.

One of the **key strategic development priorities of the National Sustainable Development Strategy for 2013-2017 and the Medium Term Development Programme for 2012-2014 of the Kyrgyz Republic is the promotion of sustainable economic growth and social inclusion.** This is to be achieved through industrial infrastructure development, sustainable private sector development, advanced and resource efficient technology promotion, affordable housing provision, rehabilitation and expansion of irrigation systems for agriculture, and sustainable job creation. The Government of the Kyrgyz Republic requested UNIDO to provide technical assistance in the development of a technical assistance project aiming at creating new jobs, attracting advanced technologies and investment in the construction materials sector.

PROJECT CONTEXT

To address the above-mentioned challenges, the Kyrgyz government requested UNIDO for the Project. The objective of UNIDO technical assistance is to facilitate the promotion of innovative and low-cost sustainable manufacturing technologies and disseminate knowledge in the area of cost effective and environmentally friendly building materials that can be easily absorbed by the local construction industry for housing and irrigation purposes. At the outset, the project will conduct a feasibility study to identify the best international and locally available technology solutions for the manufacturing of energy efficient, environmentally friendly and cost-effective building materials based on local raw materials. The technologies and know-how identified will be tested on site and used in the construction of low-cost demonstration houses and in the provision of technology solutions for rehabilitating irrigation systems. Modernization of the country's building material sector through adoption of innovative technologies and capacity building activities will facilitate community level job creation and income generating activities in the beneficiary and other related sectors, and improve livelihoods, especially in rural areas.

UNIDO has over four decades of experience in delivering technical assistance to developing countries and economies in transition. This experience has shown that effective technology management is crucial for industrial development. The proposed approach draws upon UNIDO technical cooperation projects aimed at promotion and effective implementation of know-how and technologies for production of environmentally friendly and energy efficient materials on the basis of sustainable use of locally available resources. These UNIDO projects have helped various countries in Africa, Asia and Latin America to meet low-cost construction and housing needs for low-income population. UNIDO, as a part of its ongoing programmes in the area of materials science and engineering, particularly in the construction sector, have taken steps to support the industrialization process in developing countries by building up capacity for investment promotion and technology transfer, creating awareness among policy makers, industrialists and researchers on new materials and processing technologies.

Based on this technical knowledge and experience, UNIDO identified a number of cost-effective environmentally friendly, and energy efficient technologies that can be sustainably promoted and absorbed in the low-cost construction sector in different countries, based on the following criteria:

- Materials are based on locally available renewable raw material resources, including residues and wastes from industry, forestry, agriculture, natural plant materials and fibres;
- Pre-processing and processing activities generate livelihoods in rural areas;
- Manufacturing technologies are energy efficient and lead to skills upgrading, employment generation and quality products;
- Manufacturing performed by locally trained technicians based on short term training and use of easy to operate equipment;
- Materials and manufactured components reduce/substitute imports of materials.

Due to an array of constraints, the construction industry in the country faces the challenges of material shortages aggravated by rising prices. The "traditional material" based manufacturing technologies tend to consume a lot of energy and deplete natural resources of forests and agricultural top soil. Furthermore, technological development and modernization is increasingly seen by the manufacturing sector as a tool to streamline productivity, protect the environment, enhance energy efficiency, generate employment, upgrade skills and alleviate poverty.

To address the above challenges and contribute to the Government's efforts to achieve the objective of affordable housing, the proposed project seeks **to facilitate the transfer of technologies and know-how on the production of cost-effective construction materials leading to the modernization of domestic enterprises in the construction materials sector, and quality improvement of construction materials produced by local enterprises**. One of the proposed technology solutions is to use innovative composite materials based on sustainable use of local resources from forestry, agriculture, natural fibres, plant materials, other locally available sources, such as agricultural and industrial wastes, and good clay and basalt deposits. Alternative materials can also be manufactured using natural fibres as reinforcement in a binder such as cement or polymer.

The project demonstrates how technology diffusion and absorption by local enterprises can be strengthened by integrating public policy with private investment through close cooperation with local authorities and SMEs.

The project main outputs include:

1. **Detailed technical and economic feasibility study** outlining the country's resources and needs and identifying appropriate know-how and technologies for cost-effective building materials demanded by the domestic construction industry and in rural areas and communities. The feasibility study will result in recommendations for specific project activities tailored to the country's needs and technical requirements in housing and rehabilitation of irrigation and drainage systems based on locally available, affordable and eco-friendly raw materials. Special focus will be put on promoting cost-effective, locally competitive and environmentally friendly[19] manufacturing technologies and also those aimed at generating employment in various regions of Kyrgyzstan (depending on availability and price range of locally available materials). The feasibility study will pay a special attention to environmental protection and energy efficiency issues of the proposed solutions. This output will also make extensive use of the UNIDO database for available building material technologies. The results of the feasibility study will be shared with the Government in order to raise awareness of the problem and thus contribute to the development of national long-term plans.

[19] In view of the various measures taken by the international development community towards the clean technologies, the project will, *inter alia*, seek to develop environmentally friendly building materials with a balance towards the reduction of the production and technology costs at the end of project.

- **Activity 1.1:** Visit the field, assess and select local materials such as clay, gypsum, lime stone, basalt, river sand, aggregates, natural fibres and other by-products to convert into value added cost-efficient and environmentally friendly building materials for housing and irrigation purposes. The selection of the raw materials will be also based on Environmental Impact Assessment (EIA) to be conducted in accordance with the national regulations and evaluation of its the sustainability
- **Activity 1.2:** Identify various instruments and machines available locally for manufacturing building materials and assess the possibility using them in the project.
- **Activity 1.3:** Complete a housing need assessment and identify local needs in terms of rain water harvesting, recycling of water, different methodologies for the storage and transportation of water inter alia based on samples and available information.
- **Activity 1.4:** Identify machines for the development of moulds for defining water storage, recycling, and distribution and drainage systems.
- **Activity 1.5:** Conduct research for the regionally and internationally available advanced know-how, machinery and equipment for manufacturing building materials based on identified needs, environmental impact assessment (EIA), energy and resource efficiency, and collected samples of applicable raw materials.
- **Activity 1.6:** Identify suitability of identified know-how and technology for the development of building products for construction of affordable housing under this project.
- **Activity 1.7:** Assess potential for modification and use of various kinds of machines (identified for building components and housing technologies) for the provision of better water storage, recycling, distribution and drainage system.
- **Activity 1.8:** Identify new and upcoming building materials and housing technologies, which may be adopted in Kyrgyzstan also for adoption by the local entrepreneur in future.
- **Activity 1.9:** Review existing relevant legal and regulatory frameworks in country and regional context to address possible gaps and barriers for sustainable development of building materials and related sectors.

2. **Field testing, adaptation and demonstration of technological processes** for cost-effective manufacturing of building materials and components. Field testing and adaptation of equipment will ensure that any technologies transferred as part of the project will be appropriate for the end users. These technologies will provide cheaper alternatives to imported building materials and will be used by the local construction industry in Kyrgyzstan.

- **Activity 2.1:** Procure equipment for further testing and adapt acquired technological processes to use as per local conditions (including specific properties of identified raw materials, local building materials and building systems).
- **Activity 2.2:** Test developed building materials and building systems in the laboratory and field to verify (i) their various properties as per the requirement of the building codes and building design; and (ii) the implementation of demonstration housing building for seismic and other parameter required for the cost-effective housing.
- **Activity 2.3:** Identify local networking partners for the dissemination of technology at the field level and its documentation.
- **Activity 2.4:** Adapt appropriate and affordable building materials with the support of employment generating housing machines and technologies**.**
- **Activity 2.5:** Adapt the same machineries for creating building components for irrigation and drainage purposes with special application requirements. The machinery will be adapted to develop moulds for generating building components for channel lining, rain water harvesting, water recycling, distribution and drainage systems.

3. **Transfer of know-how and technology to local manufacturers for production** through the training of local engineers, skilled and semi-skilled workers, entrepreneurs in building materials sector, and construction supervisors from Kyrgyzstan. Training will provide both male and female skilled manpower able to operate and maintain the machinery that will be demonstrated and disseminated among participating communities as part of the project. As the machinery is relatively simple to operate – with production remaining labour intensive – technology transfer of these machines will decrease the cost of housing while creating joint employment opportunities. All training for experts from support institutions and companies will be developed and rolled out in a way that they will be accessible to men and women alike (taking into account possible constraints of female workers in the context of machine maintenance/operations and handling of heavy loads, etc.).
    - **Activity 3.1:** Establish a national capacity for technology demonstration and training of the local construction workforce for learning and adoption of identified and developed housing technologies. The training and demonstration capacity will be established within the premises of an existing vocational training institution, sectoral association or local municipality administration to be identified during the feasibility study phase of the project in close consultations with local authorities of the Kyrgyz Republic.
    - **Activity 3.2:** Identify, select and train local construction workers, engineers, and staff of local agencies and other stakeholders on the production of building materials to ensure their further participation in the construction of demonstration buildings and rehabilitation of pilot irrigation and drainage objects as per applicable codes and standards in the country.
    - **Activity 3.3:** Create a national technology information base with the 15 to 20 new and emerging technologies for housing and building material production with required technical know-how, technology providers, researchers and companies, so that further building industry growth may be maintained with the support of local agencies, technology database and local entrepreneurs[20].
    - **Activity 3.4:** Develop appropriate methods and techniques for various systems of rainwater harvesting, recycling of water, different methodology for storage, transportation and drainage of water.
    - **Activity 3.5:** With the support of trained experts, develop few pilot project studies for their further implementation at ground level.
4. **Construction of demonstration houses and delivery of technology solutions for rehabilitation of pilot irrigation and drainage objects** using the new building technologies, aforementioned machines and production methods; and **communication of developed manufacturing practices** through the development of promotional materials and organization of advocacy events[21]. The demonstration objects will be used in trainings to demonstrate various technologies and techniques.
    - **Activity 4.1:** Based on results of Output 2, select the equipment and materials for production from the identified technologies and local raw resources considering their sustainable consumption for the required types of building components for housing, irrigation and drainage purposes.
    - **Activity 4.2:** Develop pre-fabricated building components for housing, irrigation and drainage purposes and standardize as per local conditions.
    - **Activity 4.3:** Conduct field level implementation through the construction of demonstration buildings at the national capacity for technology demonstration and

[20] The national technology information base will be established as a reference database complementary to existing web-platforms of a selected project counterpart/stakeholder institution. The national database will also form a basis for upscaling the developed technology solutions of country's housing problems through provision of affordable methods, technologies and building materials for construction of housing, particularly in rural areas.

[21] The project communication campaign will actively involve country level experts, technologists and entrepreneurs in order to take the project forward with industrial partnership.

training; and deliver technology solutions and capacity building activities on irrigation, drainage, water distribution and recycling for pilot irrigation objects as per the codes and standards applicable in the country and using identified and developed building materials.

- **Activity 4.4:** Organization of awareness and dissemination events through information briefings, seminars, and a final press-conference to communicate project results and manufacturing practices generated. The activity will also facilitate public-private dialogue as a means to strengthen policy making at the national level[22].
- **Activity 4.5:** Preparation a brochure, catalogue and, if possible, training module for streamlining project communication for future.

Project logframe is presented in annex 4

CURRENT STATUS OF IMPLEMENTATION

In the period of October 2014-May 2017, the project has accomplished the following activities:

- Within the framework of the UNIDO project, a technical study and survey were conducted to assess the availability of local materials and possibilities for their use in the development and production of building materials and housing construction. The following materials were identified:

  - natural resources: clay, sand, stone, limestone and gypsum are available as natural resource materials;
  - agro industrial waste: rice husks, cotton and wheat straw and corn waste
  - recyclable waste: used car tyres, waste black sheep wool and plastic and polymer wastes can be recycled and used as input material for the production of building materials.
  - Several technologies using organic and inorganic wastes have been identified. One technology already adopted with private company. Procurement of two other technologies is under process.

- Based on the research, a list of machinery and technologies were identified, including the following:

  - Plant and machinery for production of fly ash, cement, lime, gypsum, sand and aggregates based bricks;
  - Plant and machinery for production of raw and laminated medium density fibre board using various kinds of agricultural wastes;
  - Sheep wool processing w/o washing – wool deburring machine;
  - Used tyres recycling and roof tile production line (an indicative list of the equipment: ring cutter; strip cutter; lump cutter; steel wire separator; rubber crusher; conveyor; vibrating sieve; magnetic separation; rubber mixer; vulcanizing machine; mould sets);
  - Machines for making light weight roofing, walling and flooring tiles;

- The mud stabilized block/brick has been identified as the first building material, to be produced and adopted under the project. The transfer of this equipment to the project beneficiary enterprise has been completed. Respective training delivered by the experts

[22] The project will also demonstrate how technology diffusion and absorption by local enterprises can be strengthened by integrating public policy with private investment through close cooperation with local authorities and SMEs.

of the equipment supplier. The production of mud stabilized blocks at the project beneficiary enterprise is being continued and respective activities to improve the quality of the produced blocks to local conditions is being undertaken. Testing was carried out for the mud-stabilized bricks/blocks on the spot according to the existing standards for optimization of process and improvement of the properties of final products, once the equipment has been installed. The respective block samples were also successfully tested at the laboratory by the local authorities. This said equipment was installed, training conducted, technological adaptation to local conditions is in the process for selecting the optimal composition of the mud blocks. The samples of mud-stabilized blocks had been displayed as the alternative to the conventional walling material at the three-day BishkekBuild-2016 Exhibition in March 2016, the local largest and most popular flagship exhibition with a focus on the building materials and construction.

- As part of the 2nd tender, the following two technologies/equipment are to be procured: (1) sheep wool-based insulation material, (2) roofing material based on recycled tyres. As per joint decision taken by the Project Donor an additional set of equipment producing the mud-stabilized blocks/bricks were procured to the UNIDO Technology Demonstration Centre at the Kyrgyz-Russian Slavic University (KRSU).

- Based on the partnership established with the project beneficiary enterprise (Tumar Ltd) – recipient of the equipment for production of natural sheep wool insulation rolls, the UNIDO project will also be able to facilitate production the eco-friendly, affordable and innovative building materials that will be also used for construction of demonstration houses.

- As a part of the project, technologies for production of building materials were identified and adopted to the local requirements and needs, including the following:

  - Semi-mechanized transportable machinery to carry out dissemination and training for mud stabilized block technology at any location.
  - Technologies using agro waste, sheep wool and used tire for recycling and development of value added building materials.
  - A spectrum of other innovative technologies is subject of the 3rd tender currently underway.

- Capacity building activities included training and coaching of local engineers, skilled and semi-skilled workers, entrepreneurs and construction supervisors about installation, operation, production and use of interlocking mud stabilized blocks.

- As part of the 3rd tender, the project procuring the following equipment and machinery, which will be further installed, adapted and tested locally:

  - straw mats knitting machine;
  - plant and machinery for production of roofing, flooring and siding tiles;
  - natural stone splitting machinery for splitting of any type of natural stone, including river rocks, for the production of medium to large size cobble stones, small wall stones and tiles;
  - thermal modification chamber for wood;
  - mobile, universal machine for dry- and wet shotcrete application.

- The project facilitated establishment of cooperation between the State Construction Agency of Architecture, Construction and Communal Services (GosStroy), Kyrgyzstan and the Kyrgyz-Russian Slavic University (KRSU) (Memorandum of understanding was signed on 24 August 2015). The parties agreed to work together in research,

demonstration and promotion of technologies, inter alia, through a UNIDO Technology Demonstration Centre being established at the premises of KRSU.

- UNIDO Technology Demonstration Centre has been established jointly with the Kyrgyz-Russian Slavic University (KRSU). Renovation of demonstration hall is completed and currently the equipment and furniture is being procured. The Centre will be used to showcase various building materials and housing technologies. It will contribute to strengthening the skills and knowledge of KRSU students and staff and to improving public awareness about emerging and alternative technologies in the area of building materials and housing. The TDC will also disseminate hands-on knowledge among the targeted beneficiaries about the UNIDO-adopted building materials and showcasing the project achievements.

- Design and architectural plan for the construction of two demonstration houses is ongoing. 2 demonstration houses are to be built based on locally produced materials that are to be partially produced by the UNIDO-supported equipment, which also constitutes part of UNIDO Technology Demonstration Centre. Project partner, KRSU, has already identified the site for construction of demonstration houses.

- The essential concurrent component of the project is also rehabilitation of damaged irrigation channels from the construction materials and technologies as adopted by the project. As for the options for the technologies for rehabilitating the existing irrigation canals in the piloted areas, the project is exploring the possibilities for appropriate solutions such as the concrete canvas, and shotcreting.

- Publication of two technical manuals in English and Russian, including (a) Hydraform mud stabilized blocks production and installation manual; and (2) Technical manual for production and use of mud stabilized blocks. The UNIDO article informing on technical substance, project progress and achievements as well as on the Donor country supporting the project implementation was published in Republican information and analytical magazine "Industrial Kyrgyzstan" (issue 2016#11 June-July 2016). The e-version of article can be found at: www.magazine.kg

- Participation at the exhibitions, meetings with potential project partners facilitated establishment of institutional and business partnerships. Thus:

  - On 1 November 2014, the Project participated in the First Corporate exhibition "JIA Kurulush 2014" which was held in Bishkek and organized by the Young Entrepreneurs' Association (JIA). Information and public awareness about the launch of new project and its activities were disseminated by an individual UNIDO project booth, which was facilitated by organizers.

  - In March 2015, the Project attended the Building materials exhibition in Bishkek, which helped to disseminate project information and to gather information about the building materials as being already available in the country and to be introduced in the market.

  - The UNIDO Project (with participation of the project partner Tabysh ltd) is presented at the annual international construction exhibition Bishkek Build 2016 held 30 March-1 April 2016 in Bishkek, Kyrgyz Republic. The project booth is

equipped with pop up, information booklets, technical manuals, short videos about training on operation and maintenance of the first set of equipment.

- The UNIDO project and its preliminary results were also disseminated at the 3rd "Issyk-Kul 2016" Economic Forum, which brought up together the representatives of governmental offices, business communities, business associations. The forum was organized by the Investment promotion Agency under the Ministry of Economy of the Kyrgyz Republic, jointly with "Huahe International".

BUDGET INFORMATION

- Budget status as of June 2017:

Grant	Total allotment	Total expenditure	% Implementation	Donor
2000002838	US$ 1,769,911.50	US$ 1,566,880.04	88.52	Russian Federation

PURPOSE OF THE EVALUATION

The purpose of the independent terminal evaluation is to assess:

1. Project relevance with regard to priorities and policies of the Government of the Kyrgyz Republic, the Donor, and UNIDO;

2. Project effectiveness in terms of the outputs produced and outcomes achieved as compared to those planned;

3. Efficiency of implementation: quantity, quality, cost and timeliness of UNIDO and counterpart inputs and activities;

4. Prospects for development impact; and

5. Likelihood for long-term sustainability of the support mechanisms results and benefits. The evaluation should provide the necessary analytical basis and make recommendations to the Government of the Kyrgyz Republic, the Donor and UNIDO.

The evaluation should also draw lessons of wider applicability for replication of the experience gained in the project in other interventions.

The terminal evaluation will be undertaken as per UNIDO Evaluation Policy, the Guidelines for Technical Cooperation Programmes and Projects and the project document. The Project Manager, in collaboration with the Independent Evaluation Division (ODG/EVQ/IEV) will commission the terminal evaluation.

SCOPE OF THE EVALUATION

The independent terminal project evaluation will cover the project implementation period from 2014 till the end of August 2017 covering all the activities that are part of the project, with particular focus on the evaluability of the outputs, outcomes, as a result of the UNIDO technical assistance, including inputs and activities, impact and sustainability of the project implementation.

- Consider all the activities that are part of the project;
- Cover the entire results chain from inputs and activities to impact and sustainability and review processes as well as results;
- Produce recommendations (e.g. what has worked and what has not and what are the lessons from implementation to date, which issues needs to be addressed in a possible next phase and what conditions should be in place).

EVALUATION ISSUES AND KEY EVALUATION QUESTIONS

The evaluation consultant(s) will be expected to prepare a more targeted and specific set of questions and to design related survey questionnaires as part of the Inception Report, and in line with the above evaluation purpose and focus descriptions.

However, the following issues and questions are expected to be included in the assessment:

Ownership and relevance

The extent to which:

- The project objectives, outcomes and outputs are relevant to the different target groups of the intervention;
- The counterpart(s) has (have) been appropriately involved and were participating in the identification of their critical problem areas and in the development of technical cooperation strategies and are actively supporting the implementation of the project approach;
- The outputs as formulated in the project document are relevant and sufficient to achieve the expected outcomes and objectives;
- The project is relevant to the UNDAP objectives and ISID agenda.

Efficiency of implementation

The extent to which:

- UNIDO and counterpart inputs have been provided as planned and were adequate to meet requirements.
- The quality of UNIDO inputs and services (expertise, training, methodologies, etc.) was as planned and led to the production of outputs.
- UNIDO procurement services are provided as planned and were adequate in terms of timing, value, process issues, responsibilities, etc.

Project coordination and management

The extent to which:

- The national management and overall field coordination mechanisms of the project have been efficient and effective;
- The UNIDO management, coordination, quality control and technical inputs have been efficient and effective;
- Monitoring and self-evaluation was carried, were based on indicators for outputs, outcomes and objectives and using that information for project steering and adaptive management;
- Changes in planning documents during implementation have been approved and documented;
- Synergy benefits can be found in relation to other UNIDO activities in the country or elsewhere.

Effectiveness

The extent to which:

- Outputs have been produced and how the target beneficiaries use the outputs;
- Outcomes have been or are likely to be achieved through utilization of outputs;
- The project/programme contributes to inclusive and sustainable industrial development.

Impact and sustainability

- To what extent developmental changes (economic, environmental, social, inclusiveness have occurred or are likely to occur as a result of the intervention and are these sustainable;
- Was the project replicated/ did it have a multiplying effect;
- Was sustainability correctly factored in the project strategy (risks analyzed and assumptions identified at design stage and appropriately monitored during implementation);
- What is the prospect for technical, organizational and financial sustainability.

Furthermore, the evaluation will address the following questions specific to the **private sector development** related questions:

- How has private sector development (PSD) been promoted through industrial upgrading and modernization of the manufacturing sector enterprises? Did this modality fit the project purpose and objectives?
- Did the project work at the macro, meso and/or micro level? Were the choices made appropriate?
- Have private sector institutions/associations been involved in the project design and implementation? If yes, in what way? If not, should they have been?
- Did the approach adopted have the potential to address the problems identified/achieve the project objective?
- Did the project address production and market issues in a satisfactory manner?
- Has the issue of possible market distortions been considered:
    - Have beneficiary companies been selected based on transparent, fair and appropriate criteria?

    - Is the project affecting the competitiveness of existing enterprises? Have any measures been introduced to prevent market distortion?
    - To what extent have private companies been subsidized by the project
    - Are companies paying for services rendered or equipment obtained?
- If the project has worked with a limited number of selected companies, can the results be expected to be replicated to achieve higher impact?
- Have linkages to financial institutions been established? If yes, what were the results? If not, was there a need for this?
- Can enterprise effects be expected to lead to socio-economic impact such as employment or income generation, gender, equality and poverty reduction?
- Did an M&E system exist, including baseline information, to allow for measurement of results and impact?
- Have synergies with other UNIDO branches/services been exploited, in particular TCB, environment, agri-business development and energy? Would there have been a case to establish such linkages.

The following cross-cutting related questions shall be also covered by the evaluation.

Environment

- Has the project promoted environmental sustainability?
- Are any positive environmental benefits likely, even if they may be indirect?

Gender

- To what extent was gender dimension mainstreamed and operationalized during the project design and implementation?

In addition to the qualitative assessment based on the evidence gathered in the evaluation, the evaluation team will rate the project on the basis of the **rating criteria for the parameters described** in 5.

EVALUATION APPROACH AND METHODOLOGY

This terminal evaluation will be carried out in accordance with UNIDO Evaluation Policy and the Guidelines for the Technical Cooperation Programme and Project Cycle. While maintaining independence, the terminal evaluation will adopt a participatory approach and will seek the views and feedback of all parties. The lead evaluation consultant will liaise with the Project Manager on the conduct of the evaluation and methodological issues.

The lead evaluation consultant will be required to use different methods to ensure that data gathering and analysis deliver evidence-based qualitative and quantitative information, based on diverse sources (including literature reviews, field visits, surveys and interviews with counterparts, beneficiaries, donor representatives and program managers). The lead evaluation consultant will develop interview guidelines.

The terminal evaluation will apply the standard for assessing the relevance of criteria of effectiveness, efficiency, impact and sustainability of programs to assess achievements against objectives and indicators outlined in the Logical Framework.

The methodology will be based on the following:

- Desk review of project document including, but not limited to:
  (a) project / programme policy documents;
  (b) The original project document, monitoring reports (such as progress and financial reports, output reports (case studies, action plans, sub-regional strategies, etc.) and relevant correspondence;
  (c) Notes from the meetings of committees involved in the project (e.g. approval and steering committees);
  (d) Other project-related material produced by the project.
- Interviews with project management and technical support including staff and management at UNIDO HQ and in the field and – if necessary - staff associated with the project's financial administration and procurement.
- Interviews with project partners including Government counterparts, companies, and partners that have been selected for co-financing as shown in the corresponding sections of the project documents.
- Interviews with intended users for the project outputs and other stakeholders involved with this project. The evaluator shall determine whether to seek additional information and opinions from representatives of any donor agencies or other organizations.
- Interviews with the UNIDO's project management and project team members and the various national and sub-regional authorities dealing with project activities as necessary.
- Other interviews, surveys or document reviews as deemed necessary by the lead evaluator and/or UNIDO EVA.

TIME SCHEDULE AND DELIVERABLES

The independent terminal evaluation is scheduled to take place from January-February 2018.

This section contains a timetable for the evaluation process with tentative deadlines for key events, tasks, deliverables and milestones. The schedule is based on foreseen project timeline and will be adjusted according to encountered delays.

Task	**Description/ Deliverables**	**Timeframe**
Contract signed with evaluators		**January 2018**
Desk review and development of interview guidelines	Background materials provided by Project Manager	**January 2018**
Delivery of draft inception report. The report to contain work plan, key findings of desk review, methodology, sampling technique, and evaluation tools such as questionnaires and interview guidelines.	Inception report	**January 2018**
Briefing of evaluators at HQ and deskwork and interviews at HQ		**January 2018**
Evaluation mission (briefing of evaluators in the field, possible testing of evaluation tools, field visits, field research, interviews, observation,	Mission report and information collected Debriefing to field stakeholders	**January 2018**

questionnaires, etc.)		
Presentation of preliminary findings	Presentation in English to Project Manager and project team	**January/February 2018**
Additional data collection and analyses of information collected, preparation of the draft evaluation report and circulation, within UNIDO for comments	Draft report	**February 2018**
Incorporation of comments and preparation of final draft report	Final draft report	**February 2018**
Sharing of draft report with main stakeholders. Collection of comments and finalization of report	Final report[23]	**February 2018**
Presentation and submission to UNIDO, Government of Kyrgyz Republic and donors	Final Report and Management Response Sheet	**February/March 2018**

EVALUATION TEAM

The independent terminal evaluation will be conducted by one international lead evaluation consultant with one national consultant or junior international consultant who will be working under the guidance of the UNIDO Evaluation Manager in IEV in coordination with the Project Manager and with the project team in Bishkek and in Vienna.

The Job Decriptions for the evaluation team members are presented in Annex 1.

QUALITY ASSURANCE

The Project Manager (PM) will be responsible for the administration and logistical suppor for the evaluation, The draft and final reports will be reviewed and cleared by IEV The PM will distribute draft and final reports to stakeholders (upon review by IEV) for factual validation and feedback, and organize presentations of preliminary evaluation findings which serve to generate feedback on and discussion of evaluation findings and recommendations at UNIDO HQ and in the field.

The quality checklist for to be used by IEV for the evaluation report in presented in annex 3.

ANNEXES

Annex 1: Job description for team member(s)
Annex 2: TOC for the Evaluation Report
Annex 3: Checklist on evaluation report quality
Annex 4: Logical Framework of the UNIDO Project

[23] As per ToC in Annex 2 and including the ratings as per table in Annex 5.

Annex 1. Job description for team member(s)

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

TERMS OF REFERENCE FOR PERSONNEL UNDER INDIVIDUAL SERVICE AGREEMENT (ISA)

Title:	International evaluation consultant / Team leader
Main Duty Station and Location:	Home-based
Mission/s to:	Bishkek, Kyrgyz Republic, Vienna, Austria (UNIDO HQ)
Start of Contract (EOD):	June 2017
End of Contract (COB):	August 2017
Number of Working Days:	26 days

ORGANIZATIONAL CONTEXT

The international evaluation consultant will evaluate the projects according to the evaluation terms of reference. S/he will act as leader of the evaluation team and will be responsible for preparing the draft and final evaluation report, according to the standards of the UNIDO Independent Evaluation Division

PROJECT CONTEXT
As described in thisToR.

MAIN DUTIES

The Lead Evaluator is expected to conduct the following duties:

Main Duties	Concrete/ measurable Outputs to be achieved	Expected duration in (in days)	Location
Conduct desk study of project document and relevant reports	Interview and mission plan completed and validated by UNIDO	5	Home-based
Prepare an interview and mission plan			
Delivery of draft inception report. The report to contain work plan, key findings of desk review, methodology, sampling technique, and evaluation tools such as questionnaires and interview guidelines.	Inception report		
Visit UNIDO HQ for preparatory meetings (briefing); discuss inception report and finalize mission plan and appointments and ensure logistical support in place		2	Vienna, Austria

Main Duties	Concrete/ measurable Outputs to be achieved	Expected duration in (in days)	Location
Undertake field mission to Kyrgyz Republic to interview the main stakeholders, including beneficiaries and train the national consultant on interview techniques (briefing of evaluators in the field, possible testing of evaluation tools, field visits, field research, interviews, observation, questionnaires, etc.) presentation of preliminary findings to field stakeholders	Mission report and information collected	7	Bishkek, Kyrgyz Republic
Detailed analysis of field results	Preliminary findings	2	Home - based
Conduct additional phone interviews/stakeholders	Notes on interviews		
Debriefing of the evaluation (Presentation of preliminary findings)	Presentation in English to Project Manager and project team	2	Vienna, Austria
Preparation of first draft evaluation report and submission for UNIDO feedback	Draft report	5	Home-based
Additional data collection and analyses of information collected, preparation of the draft evaluation report and circulation, within UNIDO for comments			
Finalization of report upon receipt of stakeholders' feedback	Final report	3	
Total		**26days**	

REQUIRED COMPETENCIES

- Long-term experience in project evaluation;
- Experience from working with skills development/vocational training from an industry perspective;
- Experience from working with organizational development, capacity and institutional building;
- Knowledge of international institutions/organizations working on skills development;
- Experience in the Kyrgyz Republic or/and in context/ or the Central Asian region.

MINIMUM ORGANIZATIONAL REQUIREMENTS

Education: Advanced university degree in social science related disciplines including development studies, development economics, political science, international relations, and peace studies, with training in social research methodologies;

Technical and functional experience: Minimum of 10 years of professional experience in project evaluation; proven track record in evaluation of UN projects.

Languages: Fluency in written and spoken English is required. Working knowledge of Russian and/or Kyrgyz is an advantage.

Absence of Conflict of Interest:
According to UNIDO rules, the consultant must not have been involved in the design and/or implementation, supervision and coordination of and/or have benefited from the programme/project (or theme) under evaluation. The consultant will be requested to sign a declaration that none of the above situations exists and that the consultants will not seek assignments with the manager/s in charge of the project before the completion of her/his contract for this evaluation.

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

TERMS OF REFERENCE FOR PERSONNEL UNDER INDIVIDUAL SERVICE AGREEMENT (ISA)

Title:	National evaluation consultant
Main Duty Station and Location:	Home-based
Mission/s to:	Bishkek, Kyrgyz Republic and travel to potential sites
Start of Contract (EOD):	June 2017
End of Contract (COB):	August 2017
Number of Working Days:	20 days (spread over the above period)

ORGANIZATIONAL CONTEXT

The national evaluation consultant will participate and contribute to the project evaluation according to the evaluation terms of reference. S/he will be a member of the evaluation team, work under the supervision of the International evaluation consultant/Team leader and carry out the tasks assigned to him/her by the International evaluation consultant and in accordance with the standards of the UNIDO Independent Evaluation division.

PROJECT CONTEXT

As described in the terminal evaluation ToR. Under the leadership of the International evaluation consultant/Team Leader, s/he will perform the following tasks:

MAIN DUTIES	**Concrete/ measurable Outputs to be achieved**	**Expected duration (in days)**	**Location**
Review project documentation and relevant country background information (e.g., national policies and strategies, UN strategies and general economic data; in cooperation with Team Leader: determine key data to collect in the field and prepare key instruments (questionnaires, logic models…) to collect these data through interviews and/or surveys during and prior to the field missions Assess the adequacy of legislative and regulatory framework in Kyrgyz Republic	List of detailed evaluation questions to be clarified; questionnaires/ interview guide; logic models; list of key data to collect, draft list of stakeholders to interview during the field missions Brief assessment of the adequacy of the country's legislative and regulatory framework	3	Home-based
Briefing with the evaluation team leader, UNIDO project managers	Interview notes, detailed evaluation	3	Home-based (telephone

MAIN DUTIES	Concrete/ measurable Outputs to be achieved	Expected duration (in days)	Location
and other key stakeholders Assist in setting up the evaluation mission agenda, coordinating meetings and site visits Assist the Team Leader in the preparation of the Inception Report	schedule and list of stakeholders to interview during the field missions Inception Report		interviews)
Participate in the field mission	Presentations of the evaluation's initial findings, draft conclusions and recommendations to stakeholders in the country at the end of the mission. Agreement with the International Consultant and Team Leader on the structure and content of the evaluation report and the distribution of writing tasks	6	Bishkek, Kyrgyz Republic
Prepare inputs to the evaluation report according to TOR and as agreed with Team Leader	Draft evaluation report	6	Home-based
Revise the draft project evaluation reports based on comments from UNIDO Office for Independent Evaluation and stakeholders and edit the language and form of the final version according to UNIDO standards	Final evaluation report	2	Home-based
Total		**20 days**	

<u>REQUIRED COMPETENCIES</u>

Core values:
1. Integrity
2. Professionalism
3. Respect for diversity

Core competencies:
1. Results orientation and accountability
2. Planning and organizing
3. Communication and trust
4. Team orientation
5. Client orientation
6. Organizational development and innovation

Managerial competencies (as applicable):
1. Strategy and direction
2. Managing people and performance
3. Judgement and decision making
4. Conflict resolution

MINIMUM ORGANIZATIONAL REQUIREMENTS

Education: Advanced university degree in science, engineering or other relevant discipline like developmental studies or business administration.

Technical and functional experience:
A minimum of five years professional experience, including evaluation experience at the international level involving technical cooperation in developing countries. Exposure to the needs, conditions and problems in developing countries. Familiarity with the institutional context of the project is desirable.

Languages: Fluency in written and spoken English is required. Working knowledge of Russian and/or Kyrgyz is an advantage.

Absence of Conflict of Interest:
According to UNIDO rules, the consultant must not have been involved in the design and/or implementation, supervision and coordination of and/or have benefited from the programme/project (or theme) under evaluation. The consultant will be requested to sign a declaration that none of the above situations exists and that the consultants will not seek assignments with the manager/s in charge of the project before the completion of her/his contract for this evaluation.

Annex 2: TOC for the Evaluation Report

Table of Contents

Executive summary

- Must provide a synopsis of the storyline which includes the main evaluation findings and recommendations
- Must present strengths and weaknesses of the project
- Must be self-explanatory and should be 3-4 pages in length

I. Evaluation objectives, methodology and process

- Information on the evaluation: why, when, by whom, etc.
- Scope and objectives of the evaluation, main questions to be addressed
- Information sources and availability of information
- Methodological remarks, limitations encountered and validity of the findings

II. Countries and project background

- Brief countries context: an overview of the economy, the environment, institutional development, demographic and other data of relevance to the project
- Sector-specific issues of concern to the project and important developments during the project implementation period
- Project summary:
    - Fact sheet of the project: including project objectives and structure, donors and counterparts, project timing and duration, project costs and co-financing
    - Brief description including history and previous cooperation
    - Project implementation arrangements and implementation modalities, institutions involved, major changes to project implementation
    - Positioning of the UNIDO project (other initiatives of government, other donors, private sector, etc.)
    - Counterpart organization(s)

III. Project assessment

This is the key chapter of the report and should address all evaluation criteria and questions outlined in the TOR. Assessment must be based on factual evidence collected and analyzed from different sources. The evaluators' assessment can be broken into the following sections:

A. Relevance (Report on the relevance of project towards countries and beneficiaries)
B. Effectiveness (The extent to which the development intervention's objectives and deliverables were achieved, or are expected to be achieved, taking into account their relative importance)
C. Sustainability of Project Outcomes (Report on the risks and vulnerability of the project, considering the likely effects of sociopolitical and institutional changes in partner countries, and its impact on continuation of benefits after the project ends, specifically the financial, sociopolitical, institutional framework and governance, and environmental risks)
D. Project coordination and management (Report project management conditions and achievements, and partner countries commitment)

IV. Conclusions, Recommendations and Lessons Learned

This chapter can be divided into three sections:

A. Conclusions

This section should include a storyline of the main evaluation conclusions related to the project's achievements and shortfalls. It is important to avoid providing a summary based on each and every evaluation criterion. The main conclusions should be cross-referenced to relevant sections of the evaluation report.

B. Recommendations

This section should be succinct and contain few key recommendations. They should:

- be based on evaluation findings
- realistic and feasible within a project context
- indicate institution(s) responsible for implementation (addressed to a specific officer, group or entity who can act on it) and have a proposed timeline for implementation if possible
- be commensurate with the available capacities of project team and partners
- take resource requirements into account.

Recommendations should be structured by addressees:

- UNIDO
- Government and/or Counterpart Organizations
- Donor

C. Lessons learned

- Lessons learned must be of wider applicability beyond the evaluated project but must be based on findings and conclusions of the evaluation
- For each lesson the context from which they are derived should be briefly stated

Annexes should include the evaluation TOR, list of interviewees, documents reviewed, a summary of project identification and financial data, and other detailed quantitative information. Dissident views or management responses to the evaluation findings may later be appended in an annex.

Annex 3: Checklist on evaluation report quality

Independent terminal evaluation of UNIDO project:

Project Title:

UNIDO Project NO:

UNIDO ID:

Evaluation team leader:
Quality review done by: **Date:**

Checklist on evaluation report quality

Report quality criteria	**UNIDO ODG/EVQ/IEV assessment notes**	**Rating**
A. Was the report well-structured and properly written? (Clear language, correct grammar, clear and logical structure)		
B. Was the evaluation objective clearly stated and the methodology appropriately defined?		
C. Did the report present an assessment of relevant outcomes and achievement of project objectives?		
D. Was the report consistent with the ToR and was the evidence complete and convincing?		
E. Did the report present a sound assessment of sustainability of outcomes or did it explain why this is not (yet) possible? (Including assessment of assumptions, risks and impact drivers)		
F. Did the evidence presented support the lessons and recommendations? Are these directly based on findings?		
G. Did the report include the actual project costs (total, per activity, per source)?		
H. Did the report include an assessment of the quality of both the M&E plan at entry and the system used during the implementation? Was the M&E sufficiently budgeted for during preparation and properly funded during implementation?		
I. Quality of the lessons: were lessons readily applicable in other contexts? Did they suggest prescriptive action?		

Report quality criteria	UNIDO ODG/EVQ/IEV assessment notes	Rating
J. Quality of the recommendations: did recommendations specify the actions necessary to correct existing conditions or improve operations (‘who?’ ‘what?’ ‘where?’ ‘when?’). Can these be immediately implemented with current resources?		
K. Are the main cross-cutting issues, such as gender, human rights and environment, appropriately covered?		
L. Was the report delivered in a timely manner? (Observance of deadlines)		

<u>Rating system for quality of evaluation reports</u>
A number rating 1-6 is used for each criterion: Highly satisfactory = 6, Satisfactory = 5, Moderately satisfactory = 4, Moderately unsatisfactory = 3, Unsatisfactory = 2, Highly unsatisfactory = 1, and unable to assess = 0.

ANNEX 4. Logical Framework

INTERVENTION LOGIC	OBJECTIVELY VERIFIABLE INDICATORS	SOURCES OF VERIFICATION	ASSUMPTIONS
Development goal/impact			
To contribute to promotion job creation and income generating activities through the development and use of cost-effective building in Kyrgyzstan.	- Newly created income generating activities related to the building materials adopted by the Project - Number of jobs related to the building materials adopted by the Project newly created in the building materials and other related sectors	Statistical information Media reports Surveys Impact evaluations by national institutions	
Expected outcome			
SMEs in the building materials and other related sectors in Kyrgyzstan benefit from the expansion of affordable and innovative technologies for housing and rehabilitation of irrigation systems	- Employment opportunities for men and women in the relevant sector created - A total of 4 alternative building materials promoted by the local building materials sector on the local market for development of enhanced related knowledge - Increased access to and enhanced knowledge on the technologies of affordable materials for housing and irrigation purposes	Project reports Market statistics Building materials sector statistics and reports	Stable economic and social context in the country Political goodwill to implement continuously structural reforms and other arrangements for the development of cost-effective building materials as well as the promotion of SMEs in the related sectors.[24]
OUTPUTS/RESULTS			

[24]

INTERVENTION LOGIC	OBJECTIVELY VERIFIABLE INDICATORS	SOURCES OF VERIFICATION	ASSUMPTIONS
OUTPUT 1: Technical and economic feasibility study report on the development cost-effective building materials prepared	- A total of 12 technologies for cost-effective building materials needed to build a house and rehabilitate irrigation channels identified among internationally available technologies based on the assessed country's resources and needs	Feasibility study report	National counterparts provide assistance in accessing all relevant information
Activity 1.1: Visit the field, assess and select local materials such as clay, gypsum, lime stone, basalt, river sand, aggregates, natural fibres and other by-products to convert into value added cost-efficient and environmentally friendly building materials for housing and irrigation purposes. The selection of the raw materials will be also based on Environmental Impact Assessment (EIA) to be conducted in accordance with the national regulations and evaluation of its the sustainability. *Activity 1.2: Identify various instruments and machines available locally for manufacturing building materials and assess the possibility using them in the project.* *Activity 1.3: Complete a housing need assessment and identify local needs in terms of irrigation channels rehabilitation based on samples and available information.* *Activity 1.4: Identify machines for the development of moulds for defining water storage, recycling, distribution and drainage systems.* *Activity 1.5: Conduct research for the regionally and internationally available advanced know-how, machinery and equipment for manufacturing building materials based on identified needs, environmental impact assessment (EIA), energy and resource efficiency and collected samples of applicable raw materials.* *Activity 1.6: Identify suitability of identified know-how and technology for the development of building products for construction of affordable housing under this project.* *Activity 1.7: Assess potential for modification and use of various kinds of machines (identified for building components and housing technologies) for the provision of a better distribution and drainage system.* *Activity 1.8: Identify new and upcoming building materials and housing technologies, which may be adopted in Kyrgyzstan in particular by local entrepreneurs in future.* *Activity 1.9: Review existing relevant legal and regulatory frameworks in country and regional context to address possible gaps and barriers for sustainable development of building materials and related sectors*			
OUTPUT 2. Technologies for manufacturing of cost-effective building materials procured, tested and adapted for local use.	- A total of 4 produced building materials and accordingly adapted equipment, including at least 1 material for irrigation purpose	Field test results report and other project reports	Timely and efficient field test and demonstration

INTERVENTION LOGIC	OBJECTIVELY VERIFIABLE INDICATORS	SOURCES OF VERIFICATION	ASSUMPTIONS
Activity 2.1: Procure equipment for further testing and adapt acquired technologies to use as per local conditions (including specific properties of identified raw materials, local building materials and building systems). *Activity 2.2: Test developed building materials and building systems in the laboratory and field to verify (i) their various properties as per the requirement of the building codes and building design; and (ii) the implementation of demonstration housing building for seismic and other parameters required for the cost-effective housing.* *Activity 2.3: Identify local networking partners for the dissemination of technology at the field level and its documentation.* *Activity 2.4: Adapt appropriate and affordable building materials with the support of employment generating housing machines and technologies.* *Activity 2.5: Adapt the same machineries for creating building components for irrigation and drainage purposes with special application requirements. The machinery will be adapted to develop moulds for generating building components for channel lining, as well as distribution and drainage systems.*			
OUTPUT 3. National capacity (in reference to those that will be trained) for producing cost-effective building materials enhanced	- XX [Number] trained to produce the adopted building materials by use of the adapted technologies - Developed education materials - Created national technology information base in use	Project reports	

INTERVENTION LOGIC	OBJECTIVELY VERIFIABLE INDICATORS	SOURCES OF VERIFICATION	ASSUMPTIONS
Activity 3.1: Establish a national capacity for technological demonstration and training of the local construction workforce for learning and adoption of identified and developed housing technologies (UNIDO Technology Demonstration Centre: TDC). The training and demonstration capacity will be established within the premises of an existing vocational training institution, sectoral association or local municipality administration to be identified during the feasibility study phase of the project in close consultations with local authorities of the Kyrgyz Republic. *Activity 3.2: Identify, select and train local construction workers, engineers, and staff of local agencies and other stakeholders on the production of building materials to ensure their further participation in the construction of demonstration buildings and rehabilitation of pilot irrigation and drainage objects as per applicable codes and standards in the country.* *Activity 3.3: Create a national technology information base with the 15 to 20 new and emerging technologies for housing and building material production with required technical know-how, technology providers, researchers and companies, so that further building industry growth may be maintained with the support of local agencies, a technology database and local entrepreneurs.* *Activity 3.4: Develop methodology for various systems of irrigation channels rehabilitation* *Activity 3.5: With the support of trained experts, develop few pilot project studies for their further implementation at ground level.*			
OUTPUT 4. Developed manufacturing practices of the cost-effective building materials demonstrated.	- Constructed demonstration houses - Rehabilitated pilot irrigation objects - Developed promotional materials - Communication events organized and reported	Project reports Media reports	Local authorities, vocational training institution, or sectoral association provide area for demonstration houses for further training and demonstration purposes
Activity 4.1: Based on results of Output 2, select the equipment and materials for production from the identified technologies and local raw resources considering their sustainable consumption for the required types of building components for housing, irrigation and drainage purposes. *Activity 4.2: Develop pre-fabricated building components for housing, irrigation and drainage purposes and standardize as per local conditions.* *Activity 4.3: Conduct field level implementation through the construction of demonstration buildings at the national capacity for technology demonstration and training (TDC); and deliver technology solutions and capacity building activities on irrigation, drainage, water for pilot irrigation objects as per the codes and standards applicable in the country and using identified and developed building materials.* *Activity 4.4: Organize awareness and dissemination events through information briefings, seminars, and a final press-conference to communicate project results and manufacturing practices generated, and facilitate public-private dialogue as a means to strengthen policy making at the national level.* *Activity 4.5: Prepare a brochure, catalogue and, if possible, training module for streamlining project communication for future.*			

Annex 5 Rating tables

Evaluation overall Ratings will be presented in the form of a table with each of the criteria / aspects rated separately and with **brief justifications for the rating** based on the findings and the main analyses. The table below presents the template for summarizing the overall ratings.

Criterion	Evaluator's summary comments	Evaluator's rating
Attainment of project objectives and results (overall rating), sub criteria (below)		
Project implementation		
• Effectiveness		
• Relevance		
• Efficiency		
Sustainability of project outcomes (overall rating), sub criteria (below)		
• Financial risks		
• Sociopolitical risks		
• Institutional framework and governance risks		
• Environmental risks		
Monitoring and evaluation (overall rating), sub criteria (below)		
• M&E Design		
• M&E Plan implementation (use for adaptive management)		
• Budgeting and Funding for M&E activities		
Project Formulation		
• LFA (Situation, stakeholder, problem and objective analyses / Preparation and readiness)		
Project Design		
• Project Design (LFM, main elements of the project, i.e. overall objective, outcomes, outputs, their causal relationship, indicators, means of verification and assumptions)		
Project management - UNIDO specific ratings		
• Implementation approach		

Criterion	Evaluator's summary comments	Evaluator's rating
• UNIDO Supervision and backstopping		
Cross-cutting Criteria		
• Gender Mainstreaming		
Overall Project rating		

RATING OF PROJECT OBJECTIVES, RESULTS and CROSS-CUTTING ISSUES

- Highly satisfactory (HS): The project had no shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.
- Satisfactory (S): The project had minor shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.
- Moderately satisfactory (MS): The project had moderate shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.
- Moderately unsatisfactory (MU): The project had significant shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.
- Unsatisfactory (U) The project had major shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.
- Highly unsatisfactory (HU): The project had severe shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Please note: Relevance and effectiveness will be considered as critical criteria. The overall rating of the project for achievement of objectives and results **may not be higher** than the lowest rating on either of these two criteria. Thus, to have an overall satisfactory rating for outcomes a project must have at least satisfactory ratings on both relevance and effectiveness.

RATINGS ON SUSTAINABILITY

Sustainability will be understood as the probability of continued long-term outcomes and impacts after the project funding ends. The evaluation will identify and assess the key conditions or factors that are likely to contribute or undermine the persistence of benefits beyond project completion. Some of these factors might be outcomes of the project, i.e. stronger institutional capacities, legal frameworks, socio-economic incentives /or public awareness. Other factors will include contextual circumstances or developments that are not outcomes of the project but that are relevant to the sustainability of outcomes.

Rating system for sustainability sub-criteria

On each of the dimensions of sustainability of the project outcomes will be rated as follows.

- Likely (L): There are no risks affecting this dimension of sustainability.
- Moderately likely (ML). There are moderate risks that affect this dimension of sustainability.
- Moderately unlikely (MU): There are significant risks that affect this dimension of sustainability.
- Unlikely (U): There are severe risks that affect this dimension of sustainability.

All the risk dimensions of sustainability are critical. Therefore, overall rating for sustainability will not be higher than the rating of the dimension with lowest ratings. For example, if a project has an Unlikely rating in either of the dimensions then its overall rating cannot be higher than Unlikely, regardless of whether higher ratings in other dimensions of sustainability produce a higher average.

RATINGS OF PROJECT M&E

Monitoring is a continuing function that uses systematic collection of data on specified indicators to provide management and the main stakeholders of an ongoing project with indications of the extent of progress and achievement of objectives and progress in the use of allocated funds. Evaluation is the systematic and objective assessment of an on-going or completed project, its design, implementation and results. Project evaluation may involve the definition of appropriate standards, the examination of performance against those standards, and an assessment of actual and expected results.

The Project M&E system will be rated on M&E design, M&E plan implementation and budgeting and funding for M&E activities as follows:

- Highly satisfactory (HS): There were no shortcomings in the project M&E system.
- Satisfactory(S): There were minor shortcomings in the project M&E system.
- Moderately satisfactory (MS): There were moderate shortcomings in the project M&E system.
- Moderately unsatisfactory (MU): There were significant shortcomings in the project M&E system.
- Unsatisfactory (U): There were major shortcomings in the project M&E system.
- Highly unsatisfactory (HU): The Project had no M&E system.

M&E plan implementation will be considered a critical parameter for the overall assessment of the M&E system. The overall rating for the M&E systems will not be higher than the rating on M&E plan implementation.

All other ratings will be on the following six-point scale:

HS	= Highly satisfactory	Excellent
S	= Satisfactory	Well above average
MS	= Moderately satisfactory	Average
MU	= Moderately unsatisfactory	Below average
U	= Unsatisfactory	Poor
HU	= Highly unsatisfactory	Very poor (appalling)