RHEAT™ Report for Türkiye

This report was prepared by Louise Foulkes of Build Change
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About RHEAT™

The RHEAT™ has been developed by Build Change as a resilient housing ecosystem assessment tool to help countries, states, territories, cities and others to identify key gaps and challenges as they work toward achieving resilient housing at scale.

RHEAT™ specifically tracks progress against the three areas of People/Policy, Money, and Technology. Users are guided by a series of benchmark indicators, and a score is assigned to each based on the current level of progress in that area.

Scoring Legend

1	Initial stages (Inexistent or not working)
2	Getting ready (Existent, needs fixing)
3	On the road (Working, needs improvement)
4	At destination (All good)

Overall Results Summary

PEOPLE/POLICY	2.5
MONEY	2.3
TECHNOLOGY	2.7

Limitations

This RHEAT™ report was prepared by Louise Foulkes of Build Change utilizing the RHEAT™ application developed and made available by Build Change at www.buildchange.org/RHEAT. Build Change has provided this tool for public use and has not reviewed this specific report for accuracy or completeness, or in any way. The findings, interpretations, and conclusions expressed in this report do not necessarily reflect the views of Build Change, its staff or its Board of Directors. Build Change does not guarantee the accuracy of the contents of this report.

For questions on the RHEAT™ and the web application, contact info@buildchange.org. For more information on implementing successful resilient housing programs, refer to The Build Change Guide to Resilient Housing: An Essential Handbook for Government and Practitioners.

Türkiye	

** Indicators italicized and in red are incomplete. Please return to the form to complete the scoring.*

	PEOPLE/POLICY	2.5	
P1	National Policy and Legal Framework for Risk and Resilience	2.9	
	1 Decent housing is a constitutional right	3	The constitution states "Everyone has the right to a healthy living environment" (Article 56) and "The state provides urban planning taking into consideration the needs of cities and their environmental conditions, takes necessary measures to provide housing and encourages public housing" (Article 57). The public housing projects are built to high standards and have proved to be resilient based on their performance of recent earthquakes (i.e. they have not suffered structural damage).
	2 Resilient housing is prioritized in national development plans	2	Türkiye has has 5 year development plans since 1963. All eleven national development plans have housing as a priority. The 2001-2005 and 2007-2013 plans address resilient housing. The current 2018-2023 plans also addresses resilient housing, with a limited focus on urban renewal.
	3 Habitability issues are addressed	3	National policy does address habitability issues through multiple regulations but not all listed here are covered.
	4 Structural vulnerability is addressed	3	The current building code includes structural safety improvements mostly for seismic hazard. There are limited features regarding climatic hazards.
	5 Urban housing is addressed	4	National plans and policy do include specific measures for urban housing.
	6 Climate change is addressed	2	There is a national climate change adaptation plan. It lacks clear performance indicators and does not have any specific objective regarding housing resilience. Adana does not have a climate change adaptation plan yet. However, the local administrations are established special units for climate change adaptation by 2022.
	7 Land use and management is addressed	3	There are public policies for land use management planning and improvement. There are plans for land regularization. Based on the fact that cities have opened areas at risk for housing projects, within the boundaries of the laws, it is inferred that national policies need improvement.
P2	Understanding and Framing of Risk	1.8	
	1 Policymakers are aware of the risk posed by natural hazards to the national housing stock	2	The 11th development plan from Turkey (2019-2023) includes disaster management (2.4.8-721 "The main objective is: to increase social awareness against disasters, to build disaster resilient and safe settlements and to minimize loss of life and property caused by disasters through risk mitigation practices.") All provinces should have a Disaster Reduction Plan. Adana has a Disaster Risk Reduction Plan report published by AFAD. Urban transformation projects in risky areas are conducted under the auspices of Law No. 6306 on the Transformation of Areas Under Disaster Risk ("Urban Transformation Law") and the Implementing Regulation of Law No. 6306 ("Regulation"). There is academic data on physical vulnerability, but much more limited on social, economic, environmental. The policy makers have limited understanding of the existing risks to seismic risks. The local policy makers in Adana became more aware of the risk after the earthquake and hold various meetings to revise their practices. However, as the earthquake happened just 1 year before the local elections, they prefer not to make radical changes.
	2 Public disaster risk awareness	2	Public education on earthquakes and other disasters and cultivation of activities for social awareness is a main objective of the National Earthquake Strategy and Action Plan (AFAD). After the earthquake, it can be said that public awareness is increased in Adana but only for earthquakes and not for other natural disasters.

	3 Improvement of existing buildings is prioritized	2	Strengthening of existing buildings is not prioritized, and urban transformation projects mostly involve demolishing existing buildings and rebuilding. The National Earthquake Strategy and Action Plan mention retrofit in their objective only for public buildings (schools and hospitals) and civil work (transportation, pipes etc.)
	4 Framing of the problem: shift from poverty to income and risk	2	
	5 Gender and minorities needs are addressed	1	Gender Equality is part of the 11th Development Plan objectives but they are not integrated into strategies for resilient housing. No mention of minorities and risk management legislation and practices are gender blind. Turkish legal definition of minority ends up saying there are no minorities in Turkey apart from a diminished non-Muslim population predominantly living in İstanbul. There are no specifications about gender and minorities known. The refugee camps are preferred to be emptied to provide shelter for the local population (majority) in case of emergencies. There is no gender sensitivity in family reunification which has had lethal consequences, for example where couples in the phase of divorce are given the same shelter (and the women are killed or beaten). There is an article on that topic: https://www.jstage.jst.go.jp/article/tjem/254/4/254_261/_html/-char/ja
P3	**Enabling Environment for Effective Building Codes and Standards**	**3.6**	
	1 Compliance with national building codes is required by law	4	The last Turkish Building Earthquake Code (TBEC) was published in the Official Gazette on March 18, 2018, and came into effect on January 1, 2019.
	2 Code development and revision bodies	4	The Ministry of of Environment and Urbanization is responsible for Construction Product Regulation.
	3 Mechanism for code development and revisions	3	120 experts contributed to the new TBEC updated in 2018, coordinated by a code committee consisting of 15 members. If there is no declared plan to develop the code at regular frequency, the last revision, based on Eurocode 8, is advanced.
	4 National standards agency	4	The Turkish Standardization Institute (TSI) is the entity responsible of standardization in Turkey. It is member of ISO and CEN and adopted European Standards.
	5 Openness to Incremental Strengthening	3	The TBEC has a retrofit chapter (chapter 15) but no incremental approach exists.
P4	**Local Level Implementation Framework: Building Permitting**	**1.8**	
	1 Building permit process for formal construction	2	The 3194 Law on Land Development Planning and Control states that it is mandatory to obtain building permits for all structures from municipalities or governorships. The permit process is clearly defined and known by stakeholders. Obtaining building permit is not mandatory in rural settlements without zoning plan.
	2 Building permit process for informal home strengthening	1	If Building Registration Certificate can be obtained (Zoning Amnesty Law), the process is done through a declaration process, and the legal responsibility falls entirely on the owner of the building. Any change in a building (except architectural modifications and repair not affecting the load bearing elements) shall also be subject to a new building permit.
	3 Fast track semi-automated permitting for vulnerable housing	1	No fast track system exists for vulnerable housing
	4 Strong, consistent enforcement of permitting process	2	More than half of Turkey's building stock, or 13 million buildings, contravenes housing regulations, according to Environment and Urbanization Ministry data (Reuters, 26/02/2019). The frequent amnesty laws that allow regularization of buildings based on a simple declaration can hinder the enforcement of construction permit procedures

	5 Process for land regularization	3	The recently passed Zoning Amnesty law (numbered 7143) allow homeowners to obtain a substitute permit called a "Building Registration Certificate" for unlicensed structures built before 2018. This process is done through a declaration process.
P5	**Local Level Implementation Framework: Construction Monitoring**	**2.3**	
	1 Legal requirement for regulatory review of works during construction	3	There are laws requiring construction monitoring for new housing and strengthening. These are linked with the building codes. Certification of occupancy is delivered upon approval. Two major caveats: the law applies only to registered buildings and there is a significant number of unregistered buildings. Until 2021, the law indicated that the construction company is in charge of paying the fees of monitoring, which created a direct conflict of interest.
	2 Capacity of local agency implementers	2	There are enough implementors certified to enforce the permit process. Their qualifications and level of training varies. Permitting happens at the municipality level and public servants at municipal level can be influenced in their decision making process.
P6	**Enabling Environment for Construction Workforce**	**3.3**	
	1 Professional associations	3	The Union of Chambers of Turkish Engineers and Architects (TMMOB) was established in 1954 by the Law 7303 and the Decree-Laws 66 and 85 amending of the Law 6235. TMMOB is a corporate body and a professional organization defined in the form of a public institution as stated in the Article 135 of the Constitution. It reunited the Architect chamber and civil engineer chambers (among other). The civil engineer association organized events, make regular publication
	2 Worker protection body and laws	3	The Ministry of Labor and Social Security is the main responsible organization in the field of Occupational Safety and Health. There are several bodies in charge of inspection (Guidance and Inspection Board), monitoring (Social Security Institution- SGK), research and evaluation (Occupational Health and Safety Research and Development Institute - İSGÜM) and training (Labor and Social Security Training and Research Centre - ÇASGEM). If workers are protected by laws, researches shows the reality is different, conclusion of a recent study "Contractors were found to neglect their legal liabilities in paying workers' insurance premiums. Also, they overlooked safety training and were reluctant to hiring physicians at construction sites and investing in personal protective equipment (PPE). As the real constructors of projects, workers did not attach adequate importance to occupational training. In addition, they were not willing to use some PPE. Key participants of HS affairs such as workers, contractors, unions, and government should comprehend their drawbacks to overcome the current dangerous view of the industry. In this regard, related government bodies should compel contractors and workers to adapt to the relatively new regulations on occupational HS"
	3 Clear legal definition of the roles and responsibilities of AEC professionals	4	The 4708 laws clearly define the roles and responsibilities of actors in the construction
P7	**Homeowner Perception and Participation**	**2**	
	1 Coupling structural improvements with habitability improvements or building expansion	2	Very limited awareness on seismic risk among the population at large and building owners. The focus on seismic risk remains at the hazard level, with too much information on the potential for strong earthquakes, without proper information on frequency. There is close to no information publicly available on the impact, except in Istanbul. Building owners do not have a clear understanding of hazard, exposure and vulnerability for seismic risk. Climate change is similarly unknown. However for Adana, it can be said that the level of awareness is increased throughout the population.

	2 Ease of building owner participation and navigation of programs	2	People with limited means make their own house, with no or limited engineering input. These are unregistered houses, generally legalized before elections. People with better means buy their houses and see them as a commodity. They comply with the laws as long as it increases the value of their commodity. They are also ready to not comply if they find a way of raising the value outside of the law.
	3 Permitting adoption by population	2	INDICATOR CHANGED TO PERMITTING ADOPTION BY POPULATION People are aware of the need, the requirements and the process. But level of compliance varies depending on building owners preferences, their influence and the municipality's capacity. Compliance is non-standard and high only in limited highly urbanized areas.
	4 Programs for social housing	2	Very limited application. The common acceptance is that structural improvement such as structural retrofitting decreases the value of the commodity. People often reference how a paint job on a car will decrease its second hand sale value. If the building is unsafe, the first option is to take it down and build a new one. There needs to be a majority of tenants in the building in favor, and with the economic crisis, this becomes difficult. So the common trend is to ignore the risk as structural improvement decreases value and rebuilding is financially out of reach.
	MONEY	**2.3**	
M1	**National Budget Allocations for Resilient Housing Policy and Technology Perception and Participation**	**2.4**	
	1 Needed budget is allocated for informed understanding of risk	2	At national level, there is a unit for strategic planning but experts contribute on a voluntary basis due to funding limitations. Adana municipality has also a unit for strategic planning, and benefits from the Cukurova Regional Development Agency, which conducts studies and prepare the multi-annual regional development plan. Funding is limited and ecosystem assessments do not exist. There is no such focus on the strategic plans of the Adana's local administrations .
	2 Needed budget is allocated for local level implementation	2	There is limited funding for risk data and mapping. The focus is on hazard and much less on exposure and vulnerability. At local level, funding is even more limited.
	3 Needed budget is allocated for workforce development and training	3	There is a public entity (TOKI) to manage housing improvement (urban renewal) and they have sufficient budget for proper management and administration. But homeowners not selected by TOKI are on their own.
	4 Needed budget is allocated for disaster risk awareness	3	The cost of materials and labor is adequately funded within TOKI, but this does not extend to the general population. Homeowners not selected by TOKI are on their own.
M2	**Supply of Resilient Housing**	**2.8**	
	1 Government investment in infrastructure service provision	2	The provision of infrastructure is adequate when it is provided by the private sector, such as gas and electricity. But it is less so for those provided by the state, such as road, water and sewer. As a rule of thumb, housing construction precedes infrastructure. As housing has a lower return on investment period, builders are keen to expand residential areas, infrastructure generally comes later.
	2 Government supply of housing	3	One of the aim for the law of urban transformation is to provide resilient building stock which is mostly built by TOKI. Public construction of housing is currently focused on urban renewal, to take down building vulnerable to earthquakes and replace them with stronger ones.
	3 Private sector supply of housing	4	Housing is a commodity and one of the primary sources of investment and there are private companies that supply resilient building stock. However there are still examples of poor workmanship and lack of knowledge of contractors as can be seen in 2023 earthquakes.

	4 Blended funding instruments exist	2	There is an active housing rental market but it does not provide affordable resilient alternatives. The Turkish housing sector is in crisis since Covid. Rents and sales have increased beyond the inflation rate. This is a complex crisis with multiple causes: limited stock of new housing stock built to seismic standard, increase in rental demand from urban renewal (owners are renting while their building is renewed), increase in rental demand from foreigners (Syrians, Ukrainians, Russians and many more), regulations limiting rental increase.
	5 Rental market		
M3	**Government Finance for Resilient Housing**	**2.1**	
	1 Funded programs for housing improvements - structural	2	The government recently launched a program called 'you pay half, we pay half', where the government match the contribution of the homeowner towards building improvement. But there is limited detail and no concrete indicator regarding its availability/accessibility.
	2 Funded programs for housing improvements - habitability	2	There is limited government funded programs, as public sanctioned low interest credit. They are not advertised and we failed to find any bank who offers them.
	3 Funded programs for new construction	3	Yes, the government provides tax breaks, subsidies and has options to pair private sector financing for urban renewal. Urban renewal is a strategic priority for the Government, they do what they can to make it happen. Because it is a strong market, estimated at 500 billion USD, the government favors known actors.
	4 Provision of technical assistance included	2	The government advertised such partnerships with financial institutions but they are not yet available on their websites.
	5 Homeowner driven	2	There is financial incentive but no study on its availability and accessibility. Interviews indicate a lack of sufficient funding.
M4	**Private Sector Finance for Resilient Housing**	**2.2**	
	1 Financing for new (resilient) construction	2	There is a robust housing market in Turkey, but the variety of products is narrow and does not suit all market groups. They aim primarily people with steady income looking to buy urban flats in old and new residential buildings. The economic crisis which started at the end of the Covid pandemic has led to soaring housing prices and inflation rates. The availability of housing financing has gradually decreased and is close to non-existent since the beginning of 2023.
	2 Financing for structural home strengthening improvements	2	There are limited financial products for structural improvements and they are very difficult to access. The average annual interest rate on credit is 50%.
	3 Financing for home habitability improvements	2	There are no financial products for habitability improvement.
	4 Provision of disaster risk insurance	3	There is a mandatory disaster insurance policy in Turkey. Although all homeowners are required to buy it, the national coverage is around 55%. Financial institutions provide the mandatory risk insurance for each mortgage agreement they sign. Complementary insurance coverage is estimated at 20% nationwide.
	5 Provision of technical assistance included	2	Since the beginning of 2023, the high rate of inflation have led to unaffordable interest rate on all credit lines. Insurance is affordable and attractive. There is the option of the affordable DASK system with the international reinsurance backup which is not tied to the Turkish Treasury. Houseowners do not want to pay any insurance if they are not forced to (by the bank credit regulations, infrastructural obligations etc.) Even in this case they mostly do not update their data every year. Also for higher levels of insurance than the DASK upper limit, there is the private house insurance options.
M5	**Homeowner Participation and Demand for Resilient Housing**	**2.3**	

	1 Access to finance	2	Access to financing is limited to some socio-economic segments of the market. It is easy to access for them, and difficult for others. Since the beginning of 2023, access is difficult for all given the high interest rates.
	2 Adoption of disaster risk insurance	3	The mandatory risk insurance has a relatively high coverage rate. But its financial coverage is limited and homeowners need to buy additional insurance if they want to insure the whole property value. This does not happen often as there is a general lack of trust towards insurance companies. However in Adana, the adaption to insurance increased after the earthquake.
	3 Homeowner willingness to contribute to home strengthening	2	Anecdotal evidence suggests the contrary, most homeowners are willing to do everything to reduce the cost of construction. This includes illegal actions in some cases. In the post-earthquake Adana, the willingness of houseowners increased significantly. But due to the high cost of strengthening, it is very hard to make a communal decision in buildings populated by different families.
Technology		**2.7**	
T1	**Technical Content and Quality of Building Codes and Standards**	**2.8**	
	1 Building codes and standards for new construction	3	Updated building code in 2018. Focus is on seismic, limited scope on hydro-meteorological hazards. Building code is a one size fits all for all the country, independent of the region and its specific hazard profile. The code covers a selected array of building systems and materials. https://www.preventionweb.net/news/turkey-new-building-code-earthquake-resilience In addition to recent earthquake regulations, and existing codes of Tse, Turkey also uses European Building Codes (Eurocodes) and even makes them mandatory in some matters, but there is still a long way to go.
	2 Building codes and standards for habitability	3	
	3 Building codes and standards for strengthening existing buildings	3	Chapter 15 of the updated building code has Special Rules for Evaluating and Reinforcement Design of Existing Building Systems Under Earthquake Effect.
	4 Technical guidance to codes and standards is available for a variety of audiences	2	Making regulation accessible to various audiences has not been a priority.
T2	**Risk Data and Mapping**	**2.3**	
	1 Hazard data and mapping is available	3	There is comprehensive mapping of seismic hazard for all the country but more limited for hydro meteorological hazards. See https://thinkhazard.org/en/report/249-turkey
	2 Exposure data is available	2	There are few data sets on exposure at national and local level, except for Istanbul and Izmir. More comprehensive and continuously updated studies are needed
	3 Physical vulnerability data is available	2	There are studies on vulnerability of different structural types. However building stock information is limited or does not exist for many cities in Turkey. Therefore it can be said that physical vulnerability based on location is not available. Study on masonry structures: https://gcris.iyte.edu.tr/bitstream/11147/11037/1/10174132.pdf Study on braced frames: https://www.x-mol.net/paper/article/1519407903236046848 Study on mid rise concrete structures: https://www.researchgate.net/publication/341481790_Seismic_Design_of_Mid-Rise_Reinforced_Concrete_Structures_According_to_TEC_2007_and_TBEC_2018
	4 Social, economic and environmental vulnerability data is available	2	Census data available here: https://ghdx.healthdata.org/organizations/state-institute-statistics-turkey Statistical data here: https://www.tuik.gov.tr/Home/Index
T3	**Technical Capacity of Construction Workforce**	**2.8**	

	1 Skilled workforce for resilient new buildings	3	Ministry of Urbanisation opens courses at various times for construction workers and gives certificates to those who succeed. The skilled workforce is available in terms of both engineers and workers. However, unskilled and uncertified workers are given permission by contractors which can result in poorly constructed buildings.
	2 Skilled workforce for resilient improvements to existing buildings	2	
	3 Designers and builders adoption of available risk data and mapping	3	
	4 Quality and availability of materials	3	As per Section 3.2 of this study: https://www.sciencedirect.com/science/article/pii/S2214509514000321., many of the buildings built before 2001 have lower quality concrete than is required in the current code. This is also true for reinforcing steel. But due to Construction Inspection Law (Law No 4708), there have been an increase in concrete strength
T4	**Digital Technology**	3	
	1 Permitting process is supported	3	There is a complete system covering the permitting process, but it is vulnerable to manipulation. https://ec.europa.eu/eurostat/cache/metadata/EN/sts_cons_per_esms_tr.htm building permit process: https://acaryp.com/en/how-to-get-a-building-permits-in-turkey/
	2 National databases for risk	3	See T2.3-4
	3 Technology for design and construction	3	"Turkish universities, such as Istanbul Technical University (ITU) and Middle East Technical University (METU), have been at the forefront of developing technology to enhance resilience against earthquakes. Techno-clusters comprising companies from these universities work on earthquake tools and prepare feasibility reports for the Disaster and Emergency Management office of the Presidency (AFAD). Collaboration with the Turkish Ministry of Environment, Urbanization, and Climate Change further adds credibility to these endeavors." https://www.trade.gov/market-intelligence/turkey-design-and-construction-earthquake-technologies-turkiye
T5	**Homeowner Perception and Participation**	2.5	
	1 Level of awareness of population regarding hazards, exposure and vulnerability	3	There are sites to help for permitting (see T4.1). Various professionals advertise their business.
	2 Technical assistance access by workforce and homeowners	2	There are a lot of articles blaming the policing and enforcement of the Building Codes on the damages/destrution of the recent earthquake, e.g. https://apnews.com/article/politics-2023-turkey-syria-earthquake-government-istanbul-fbd6af578a6056569879b5ef6c55d322.
	3 Code adoption and enforcement in general population		

About Build Change

Build Change saves lives in earthquakes and typhoons. Our mission is to greatly reduce deaths, injuries, and economic losses caused by housing and school collapses due to earthquakes and typhoons in emerging nations.

Our vision is that (1) all houses and schools built with inputs from Build Change in seismically active emerging nations are resistant to earthquakes and other natural disasters, and (2) building codes are enforced or construction practices are permanently changed so that houses and schools built in the absence of external funding and technical support are also earthquake-resistant.

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