iTenure- New Tool for Land Claim Registration and Legal Advice on Land Tenure Status

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Abstract

During last 25 years Cambodia has experienced significant growth and development. The country’s economy grows second fastest in the region (after Myanmar) at 7% a year (ADB 2017). Much of this development happens in Phnom Penh, the capital of the 15 million people nation. Once completely depopulated by the Khmer Rouge forces in spring 1975, Phnom Penh is developing rapidly which is particularly visible when looking at city’s landscape filled with new buildings’ construction. The land values rapidly increased in the recent years putting significant pressure on the land rights of the most disadvantaged and vulnerable urban dwellers (WTE, 2015). Country’s regulations regarding land expropriation, titling and conflict resolution are fairly complex and citizens are often not aware of their situation, their rights, and of legal processes related to land tenure security. According to Land Rights groups approximately 150 000 people were evicted in Phnom Penh in the last 25 years (STT, 2013a, p. 3) and there are 48 000 people in the city who are still living under threat of eviction (STT, 2017).

This paper explores the response from the Civil Society Organizations in regards to legal education and awareness of the communities living under threat of eviction and in particular its effectiveness and efficiency. The case study of the communities in Chrang Chamres is used to illustrate how GIS, new mobile data collection and Interactive Voice Response tools can be used to accelerate this process. It finally suggests how iTenure application developed by “Human Rights Based Spatial Planning” project consortium funded by European Union and Czech Development Cooperation could be used in other land conflicts in Cambodia and elsewhere.

Key Words:

Land Tenure, Technology for Development, Evictions, Legal Empowerment
1. Introduction

In Cambodia, thousands of people are affected by land conflicts. According to some rights groups over 500,000 Cambodians have been affected by land conflicts and deprived of their land, housing and forest, often in violation of Cambodia’s land laws (LICADHO, 2014). Country’s regulations regarding land expropriation, titling and conflict resolution are complex and citizens are often not aware of their legal situation, their rights, and of the legal processes related to land tenure security. It is, therefore relatively easy to manipulate, threaten and confuse uniformed, impoverished Cambodians who already have little trust in transparency and accountability of Cambodian courts. According to one of the human rights groups active in Cambodia: “The lack of procedural and legal safeguard when implementing some projects has led to an environment of unregulated development characterized by a lack of transparency, consultation and planning. This is intensified by a politically dependent judiciary, which fails to provide fair and prompt resolutions for many land conflicts” (CCHR, 2013, p. 4). As a result, land plots of poor families (specially plots located in “desirable” areas) are often excluded from the systematic land registration program (started in 2002) for being considered “too complex” or having an “unclear status” (CCHR, 2013, p. 17). However, there are no definitions of what this means, leaving it to the sole interpretation of the state authorities. In consequence, families prone to eviction and land conflict are left without titles, in a constant state of land insecurity, remaining exposed to human rights violations.

Civil Society Organizations have been responding to this problem by supporting communities under threat of evictions in variety of ways including: community organizing, mapping, enumeration, legal training and assistance, preparation of onsite redevelopment plans, etc. One of the most challenging activities has been legal training and advice provided by CSOs to the families living under threat of eviction. While it is relatively easy in case every household in the community lives on the same type of land and moved there before August 2001 (new Land Law approval date), it becomes problematic when several different land categories are present in one community as depending on this, the strength of the land claim would be determined.

People in Need and Sahmakum Teang Tnaut attempted to address this problem in their Human Rights Based Spatial Planning project implemented in 2014-2015. The project, among other activities, aimed at providing legal analysis and advice sheets to 1295 households living in Chrang Chamres area in Phnom Penh (the target area of the project). The activity drained the resources of the NGOs demonstrating that this approach would not work at larger scale if it does not use more advanced technologies in data collection, analysis and geo-spatial analysis. The enlarged consortium for the second phase of the project (2016-2018) has therefore
introduced a new tool which would use mobile data collection, GIS and IVR tools to generate the reports and advice sheets in an automated manner (www.itenure.net).

2. Global trend of community mapping in informal settlements and how this links with uneven distributions of tenure information

2.1. Legal empowerment and tenure security
This section reviews key concepts in the literature related to legal empowerment and tenure security. First, we show that legal recognition of property claims has long been established as a key indicator of tenure security in the literature. Second, we detail the approaches of CSOs to increase tenure security for urban poor areas excluded by the state from acquiring legal security, highlighting participatory community mapping exercises and recent efforts to digitise this process. Finally, we advocate for a legal empowerment approach that harnesses both community-level and technical-legal aspects to increase tenure security for urban poor residents.

2.2. The importance of legal tenure
Increasing tenure security for the urban poor has been at the heart of urban poverty reduction efforts for over four decades. The emphasis on tenure security began in the late 1970s, when John Turner reappraised orthodox representations of urban poor areas as cause of poverty, to position urban poor communities as a solution to poverty (Doebele, 1987; Turner, 1977). The key condition, he believed, that enabled communities to rise out of poverty was state-provided legal tenure security. If the state provided the legal conditions of tenure security for the urban poor, he argued, communities would invest time and resources in upgrading their settlements.

Since the 1970s, the state providing legal recognition of property claims – either on a communal or Individual basis – has been considered a key indicator of tenure security for the urban poor (De Soto, 2000; Jones & Ward, 1994; Van Gelder, 2010). Legal recognition is so important for tenure security because of the relationship it describes between urban poor communities and/or households and the state. The state has the power to evict residents whose property claims it has deemed are illegal and the responsibility to protect property claims that are deemed to be legal. Consequently, policy makers working to improve conditions for the urban poor have promoted inclusive legal frameworks that provide secure, legal land rights.

International development institutions and NGOs have developed a number of policy frameworks that can increase the legal tenure security of poor urban groups. These have ranged from the government passing laws to prevent evictions (Payne, 2005), to securing legally recognised indigenous land rights (Toulmin,
to providing individual land titles to urban poor households (De Soto, 2000). The latter of these approaches – the individual land titling model – has perhaps been the most globally replicated of these approaches. Donor-supported land titling programmes have spanned South America, Africa and Southeast Asia, including Cambodia (Conning & Deb, 2007; Markussen, 2008).

In addition to legal tenure security, commentators have also identified *de facto* tenure is also an important condition of security (Gilbert, 2002). *De facto* security describes factors other than legal status that contribute to tenure security. Such factors may include the extension of public utilities services to residents of urban poor communities, or cooperation between local authorities and communities around local infrastructure upgrading (Varley, 1987). Many studies across the globe have found that even in the absence of full legal recognition of residents’ property claims, these *de facto* indicators from the state have been sufficient to convince urban poor communities will not be evicted (Gilbert, 2012; Payne, Durand-Lasserve, & Rakodi, 2009). In some cases, increases in *de facto* security can eventually lead to legal security through increasing the legitimacy of urban poor settlements in the eyes of authorities (Van Gelder, 2010).

### 2.3. Supporting communities excluded from legal tenure

Often urban poor settlements have been excluded from obtaining legal recognition of their tenure claims. In such cases, authorities are unwilling to provide urban poor households with assurances that they will not be evicted. They exist in a state of legal limbo, regarded as temporary, and at constant risk of being evicted so their property can be transferred to commercial practices, which are considered a more productive use of space by many governments (Yiftachel, 2009). This trend is particularly evident in rapidly developing cities, where there is high competition for land with redevelopment potential and, consequently, powerful interests intent on capturing the lucrative urban real-estate where urban poor settlements reside (Durand-Lasserve, 2007).

In the absence of state recognition of property rights, CSOs have been active in developing strategies to strengthen the claims of those living in urban poor areas excluded from legal security. A key strategy has been to collect detailed information about the community that provides a basis for equitable upgrading interventions and more cooperative interactions with local authorities. To this end, participatory enumeration and mapping of urban poor communities has been promoted by international organisations such as UN-HABITAT and local urban poor federations across the globe. According to Karanja (2010), the key components of such interventions are as follows:

- Collecting basic information about number of households and dwellings and their characteristics;
- Information about business and public institutions operating in area;
- Information about local infrastructure;
- Information about tenure claims, including type of documentation;
- Maps of dwellings and other land use categories.

Empirical studies have suggested that this approach has been successful in increasing *de facto* security through building a cooperative relationship between urban poor communities and authorities (Karanja, 2010; Satterthwaite & Mitlin, 2013). In Bangkok, for example, such an approach has been noted as providing a successful basis for a city-wide plan of settlement upgrading and, in the process, has increased tenure security for urban poor dwellers (Archer, Luansang, & Boonmahathanakorn, 2012). Strengthening *de facto* security by fostering cooperative relationships between the state and urban poor communities can eventually lead to legal recognition of tenure rights from government, which has occurred in some of Phnom Penh’s urban poor settlements (Flower, 2017).

Recently, CSOs have harnessed developments in technology in mapping communities excluded from legal tenure. To this end, there have been a variety of applications for smart phones and other devices able to digitally record residents’ tenure claims. The subject of this paper, iTenure, harnesses this approach to community mapping and enumeration. These recent technological innovations provide an opportunity to radically upscale community mapping and enumeration exercises. Details about current digital tenure interventions are addressed in Section 5.

### 2.4. Towards legal empowerment

The community mapping and enumeration approach has in many cases provided a solid foundation for settlement upgrading and strong relations between communities and local government. In other cases, however, communities may face an imminent threat of eviction, and cooperative relationships are not a viable route to increasing security in the short-term. In such cases, evidence suggests that technical-legal strategies that leverage community and individual rights through legal frameworks can benefit vulnerable groups (Flower, 2017; Grimsditch, Leakhana, & Sherchan, 2012; Roy, 2005). In India, for example, a legal challenge brought by advocates representing a low-income community against the government was successful in securing the rights of residents due to be evicted as part of a dam building project (Roy, 2005).

The prevalence of donor-funded land interventions globally offers significant opportunities for legally asserting the rights of the urban poor. Land laws have often been designed as a condition of donor funding.
to enable vulnerable groups to obtain legal recognition of their property claims. In cases where these laws have not been followed and urban poor groups have been unfairly excluded from acquiring legal recognition of their property claims, a legal empowerment approach can provide technical support to those attempting to assert their rights in complex legal systems. In Cambodia, for example, technical support from legal experts enabled residents in the Boeung Kak lake area to legally challenge the government’s decision to exclude their plots from acquiring land titles. This challenge resulted in some members of the community acquiring legal recognition of their plots (Flower, 2017).

Taking a broad view of legal empowerment and tenure rights one can observe two main approaches. The first advocates for community mapping and enumeration to provide a basis for cooperative relationships with authorities. The second emphasizes technical legal knowledge as a basis to assert the rights of urban groups through established legal frameworks. Both these approaches provide opportunities to legally empower excluded urban poor communities and, when combined, provide a solid legal basis on which to improve the lives of urban dwellers. In remainder of this paper, we detail how iTenure harnesses advances in technology to combine these community-centred and technical-legal approaches to legally empower urban poor communities in Phnom Penh and, in doing so, increase their tenure security.

3. Complexity of Cambodian Land Law

3.1. Background on tenure security for urban poor in Phnom Penh

Despite of ongoing civil war (1970-1975), in April 1975, the times of relatively steady development of Cambodia following independence from France in 1953 were over. The Khmer Rouge forces after capturing Phnom Penh from Lon Nol government decided to evacuate its residents and emptied the city. Between 1.5-2.6 million people were forced to leave their houses within 24 hours and move to the rural work camps (ECCC, 2012). During Khmer Rouge rule, all properties were nationalized and cadastral records largely destroyed (Strangio, 2014, p. 155). The consequences of that action continue to be felt today, by creating space for land grabbing, speculation and exclusion of the urban poor from legal land ownership. Private property rights were reinstated in April 1989 when the government passed a decree recognizing ownership of residential properties as well as the right to transfer that property through succession. Following this, a new land management policy was adopted confirming that the state was the default owner of the country’s land, but authorizing the right to acquire ownership of residential land. This was

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1 This sub-chapter is largely based on the Sasin, Sarom “Human Rights Based Spatial Planning in Cambodia. Learning from the past and identifying new win- win spatial solutions in Phnom Penh” paper presented at “Land & Poverty” conference in March 2015
distinguished from possession of agricultural land, which could be used and controlled privately as long as it was being put to productive use. (STT, 2013a). The 1989 decree privatizing land was followed by a land law in 1992, which set out rules relating to the ownership of private property, including the steps households needed to take to procure legal land title. Most urban poor systems were unable to acquire land title under this system and instead had to rely on temporary possession certificates or land transaction receipts stamped by local authorities (Flower and Grimsditch, 2014).

In the 90’s the Cambodian capital experienced high growth and development attracting people from rural areas looking for better wages and life opportunities in the cities. In a context of rising property prices, well connected developers were able to capitalize on the poor’s weak property rights to acquire large areas of prime real estate where urban poor communities resided. As a result, according to STT approximately 4000 families were evicted throughout the 90’s. To address the problem of tenure insecurity a new Land Law passed in 2001, which established a basis for systematic land titling of all eligible properties in the city. However, many urban poor communities were excluded from this program and did not receive land titles The first decade of 21st century proved to be much worse in this regard with just under 43 000 families evicted (STT, 2014c).

3.2. Land classification and registration in Phnom Penh

The 2001 Land Law is the principle piece of legislation related to land tenure in Cambodia, supplemented by various other sub-decrees, prakas (regulations), circulars and other administrative documents. In order to assess the tenure situation of residents in urban poor settlements it is important to understand key legal concepts used in these documents, including ownership, legal possession and illegal occupation. This section of the manual provides an explanation of these terms, along with discussions on the related issues of land classification and documentation (Flower, Grimsditch 2015).

- **Ownership**

The Cambodian Constitution recognises that all persons have the right to private ownership. Ownership should be protected by law, and the right to confiscate private property from any person may only be exercised when in the public interest and only after a fair and just compensation is paid (Constitution of the Kingdom of Cambodia, as amended in1999, art. 44). This is also acknowledged in the Land Law of 2001 (Land Law, 2001, art.5).

In order to definitively prove legal ownership of land it is necessary to obtain a land ownership title issued by the MLMUPC. There are two ways to obtain a land ownership title in Cambodia:
• **Systematic Land Registration** refers to the government proactively titling land parcels. The process involves government systematically adjudicating and registering all property rights in a given area, providing all eligible property owners with land titles.

• **Sporadic Land Registration** refers to a process of land registration initiated by the person claiming ownership of the land he/she resides on by submitting an application for land title to the government.

The fact that someone does not hold a land title does not necessarily make their land occupation illegal. Under the Land Law they may be regarded as a ‘possessor’.

• **Legal Possession**

Under the Land Law any person who was in occupation of their land prior to the date the law was adopted (August 2001) may be a legal possessor. In order for possession to be legal, a landholder’s occupation must also be unambiguous, non-violent, notorious to the public, continuous and in good faith (Land Law, 2001, art. 31). In addition, the land in question must not be state public land (Land Law, 2001, art. 16, 43.). The issue of land classification is further analyzed in the following sections.

Legal possession provides similar rights and protections to those of an owner. This means that a possessor has exclusive rights to his/her land while waiting for that possession to be converted into full ownership (Land Law, 2001, art 43). Possessors can stop others from entering the land and transfer all or part of their property to others. Anyone meeting the requirements of possession has the right to apply for an ownership title, but if the land is contested, the claimant must be able to prove that he/she meets the requirements of legal possession (Land Law, 2001, art. 31).

The Land Law clearly states that any new occupation that starts after the passing of the law is not legal (Land Law, 2001, art. 34). However, if someone moves into a property after August 2001 but the land has been continuously occupied by others before 2001, their possession can be legal provided they meet the above criteria, and as long as the land is not state public property (Land Law, 2001, art. 30). In cases such as this, the current occupant may have to provide evidence that there is a continuous chain of possession going back to before the Land Law (Flower, Grimsditch, 2015).

Legal possession does not constitute an indisputable right to the land. In cases where there are competing land claims, the parties claiming the land must be able to prove that they are the legitimate possessor (land Law (Land Law, 2001, art. 30). This means that it is important for possessors to gather and keep documents related to their land, as well as any other documents that show the length of their occupation (documentation is returned to below). These documents can be used to prove legal possession in case of a dispute and can also be used to support an application for a land ownership title (Flower, Grimsditch, 2015).
• **Illegal Occupation**

Those who do not have an ownership title and who do not meet the legal requirements of legal possession are likely to be regarded as illegal occupants of the land on which they live. In many cases these people may not be aware that their occupation is illegal and may have resided on their land in full knowledge of local authorities without ever experiencing any problems or being told that they are illegal occupants. In some cases they may be in possession of land occupancy documents or land sale contracts that were witnessed by local village chiefs or commune officials. However, if their occupation does not meet the conditions set out above they are likely to be regarded as illegal occupants under the law. Illegal occupants may include:

- Households that commenced occupation of vacant land after the Land Law was passed.
- Households that commenced occupation of land before the Land Law was passed, but do not meet the five conditions of legal possession.
- Households that are occupying land that is legally owned by somebody else.
- Households that are occupying state public property, no matter when they commenced occupation.

Under the Land Law illegal occupants have limited protections and may even be fined or imprisoned if they are found to be illegally occupying state public land. The law states that people occupying state public property must vacate immediately and have no right to compensation for the land or any building or improvements conducted on that land (Land Law, 2001, art. 259). However, Cambodia has international human rights law obligations, which include respecting the right to adequate housing. General Comments interpreting this obligation have stated that no one should be evicted without good cause, and no one should be made homeless and should not be left poorer after eviction (UNOHR, 1991, 1997). Cambodia now has a basic framework for either relocating or upgrading illegal settlements in urban areas (Circular 03 on Resolution of Temporary Settlement on Land Which Has Been Illegally Occupied in the Capital, Municipal, and Urban Areas).

• **Land Classification**

As stated above, occupation of state public land is not legal and no one can claim legal possession of state public land. It is therefore important to understand exactly how this type of land is defined and identified. The Land Law breaks property down into the following major categories (Lindstrom Grimsditch, 2013):
State public property is land held by the state that has a general public use, benefit or service. This includes roads, public gardens, schools, hospitals and administrative buildings. It also includes land that is of natural origin such as rivers, lakes and seashores, and areas of archaeological or heritage value (Land Law, 2001, art 15). As already mentioned, state public property cannot be owned or possessed by private individuals, and encroachment on state public land is in offense punishable by a fine or time in jail.

State private land is all the land that is neither state public land, nor legally privately or collectively owned or possessed under the Land Law (RGC, 2005, Art. 5). State private property may be subject to sale, exchange, distribution or transfer of rights to private individuals or companies, provided this is in accordance with the law (Land Law, 2001, art. 17).

A number of regulations have been issued which set more clear definitions of the different types of state public property, such as roads, rivers, riverbanks, lakes, etc. These regulations explain, for example, how far from a river the riverbank extends. These definitions are extremely important as they can make the difference between someone’s occupation being legal or not.

The following is a list of the types of state public property that may be found in urban areas and the regulations associated with them, especially relevant for the Chrang Chamres case (Flower, Grimsditch, 2015):

<table>
<thead>
<tr>
<th>ROADS</th>
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<tbody>
<tr>
<td>• The law regarding state public land and public roads in urban areas is ambiguous. The relevant legal documents include:</td>
</tr>
<tr>
<td>Sub-decree #197 on the Management of Rights of Way on National Road and Railroad Networks of the Kingdom of Cambodia, November 2009 (RGC)</td>
</tr>
<tr>
<td>• Level one national road (e.g. National Road 1), right of way = <strong>30 meters from either side of the road</strong>.</td>
</tr>
</tbody>
</table>
- Level two national road (e.g. National Road 21), right of way = 25 meters from either side of the road.
- The rights of way of national roads that cross the capital or town do not follow the above rules, but it is not clear if there is a strict rule for road rights of way in the city.

Decision #52 to attach the Text on Criteria for State Land Classification as an Annex of Prakas N#42 Dated 10 March 2006 On State Land Identification, Mapping and Classification, December 2006 (MLMUPC)

- Roads located within cities, provincial town or district capitals do not necessarily have reserves but shall have sidewalks. Such roads and sidewalks are also state public land.
- Criteria for determining city, provincial town and populated areas should be established.

Letter #442 from Senior Minister, Minister of The Ministry of Land Management Urban Planning & Construction to His Excellency Provincial Governor and as a Head of City and Provincial Committee

- States that the reserved area of National Highway 5 is 30 meters and also adds that building is not permitted within 4 meters of this reserve. This suggests that a total of 34 meters around National Highway 5 is regarded as state public property.

### RAILWAYS & RAILWAY STATIONS

Decision #52 (MLMUPC)

- Inside cities, towns and populated areas the right of way for railways is 20 metres from the axis of the track.

### QUAYS AND PORTS

Decision #52 (MLMUPC)

- Land of those quays or ports designed for the general interest shall be classified as state public land.

### AIRPORTS

Decision #52 (MLMUPC)

- Land of airports that are specially developed for the general interest shall be classified as state public land.

### TRACKS & PATHWAYS

Decision #52 (MLMUPC)

- Tracks and pathways that are made available for public use are state public properties.
- Track is a way linking 2 Phum within the same Khum and on which it is possible to drive a car.
- A pathway is a way that links a block of houses to another in a Phum or a dike dam or canal dam on which no more than a motor-bike or bicycle can pass.
- No reserve is needed for tracks and pathways.
### Decision #52 (MLMUPC)

- Article 15 of Land Law of 2001 stipulates that **any property that is made available, either in its natural state or after development, for public use**, is public domain of the State.
- Article 12 of the 1994 Law on Land Management, Urban Planning, and Construction, states that public gardens and parks and development areas are public areas.
- Public gardens and parks are state public land.

### EDUCATIONAL INSTITUTIONS, ADMINISTRATIVE BUILDINGS & PUBLIC HOSPITALS

**Decision #52 (MLMUPC)**

- Land of public schools or educational buildings, land of administrative buildings, land of public hospitals and health centres as well as the premises of those establishments located on State land are state public land.

### RIVERS

**Decision #52 (MLMUPC)**

- Rivers (Tonle) are floatable or navigable water courses that are determined as such ‘Tonle’. In total there are 7 rivers in the Kingdom of Cambodia: Mekong, Bassac, Se San, Sap, Se Kong, Srae Pok and Toch rivers.
- River land is **the land between both banks of river and normally contains water in dry season.**

### RIVER BANKS

**Decision #52 (MLMUPC)**

- River banks are **parts of land that is located between the highest water line of rainy season and lowest water line of dry season** of the demarcation year except an abnormal flood season.

### NAVIGABLE AND FLOATABLE WATER COURSES (OTHER THAN RIVERS)

**Decision #52 (MLMUPC)**

- The width of navigable and floatable water courses shall be **between the highest water lines of both sides of the water course in rainy season** except an abnormal flood season.
- Non-navigable or non-floatable water courses shall be classified as state private land.
- If the width of the water course is less than two meters, the water course land shall be registered as part of the land parcel(s) on both sides of the water course.

### NATURAL LAKES

**Decision #52 (MLMUPC)**

- The bed (body) of a natural lake, **limited to the water line of dry season** of the demarcation year except an abnormal drought year, **is state public land**.
- Land **area between the highest water line of rainy season and lowest water line of dry season, shall be classified as state private land**, except those parts that clearly have public use or public interest that shall be classified as state public land.
ISLANDS

Decision #52 (MLMUPC)

- Islands or parts of islands that is clearly shown as having public use or public interest shall be
classified as state public land. Others than this shall be classified as state private land.
- Islands that were under lawful possession prior to the promulgation of the 2001 Land Law can be
granted as private ownership.

OTHER LAND WITH PUBLIC INTEREST USE CHARACTERISTICS

Decision #52 (MLMUPC)

- Article 4 (h) of the Sub-Decree #188 ANK.BK, on State Land Management provides that other land
having public interest characteristic and land already has legal basis is a category of state public
land.
- Sewage-drainage canal/system along undeveloped roads must be classified as state public land.
- Electric station land and land used to distribute state-owned electricity and stations for
distributing state-owned fresh water and land or places for holding state water have to be kept
as public state land.

In addition to state public land, it is also important to bear in mind that property belonging to monasteries
cannot be privately owned, according to the 2001 Land Law. Article 21 of the 2001 Land Law states:
Monastery immovable property cannot be sold, exchanged or donated and is not subject to prescription.

- Land Documentation

Documents are an important tool for landholders to prove that they have rights to their land and to protect
that land from disputes. The strongest document is a land ownership title issued by the MLMUPC, which
proves definitive ownership of the land in question. Although, as mentioned above, many people that do not
hold a land ownership title may be legal possessors.

Legal possession is not as strong as ownership and can be challenged more easily by other individuals or by
the state. For this reason, it is important for possessors to gather and save documentation related to their
land as this can be used to prove that they are the rightful possessor. These documents can also be used by
the landholder to prove that his/her possession is legal when applying for a land ownership title.

In order to prove that possession is legal, one of the most important things is to show that the land has been
continuously occupied (either by the current occupant or someone else) since before August 2001. Various
types of documents can be used to support a claim of legal possession. The strongest evidence that
possession is legal is land documentation issued by competent authorities, for example, the sangkat, khan
or municipality. The higher the level of the issuing authority, the stronger those documents are. These
documents may include:
• Slab moan (survey paper from pre-2001 land administration system)
• Receipt for pre-2001 land title
• Occupancy support documents from the sangkat or phum
• Land transfer letters (these are stronger if signed by the sangkat or phum)

In cases where people have no document that relates directly to their land, they may use other personal documents as evidence to support a claim of legal possession if they show that the land has been occupied since before August 2001. This may include:

• National ID card
• Voter ID card
• Birth certificate
• Family book
• Residents book
• Receipt for payment of land taxes
• Savings book
• Any other official document that shows occupation at this address since before August 2001

While documentation is very important, it should be kept in mind that just having (or not having) documentation does not necessarily prove (or disprove) the legality of an individual’s possession. For example, if officials unlawfully granted tenure documents to people who are occupying state public property, the papers are invalid. It is also possible that someone may not have legal papers, but may have legal possession rights due to the nature of their occupation. An assessment of possession rights should be based on the facts of the occupation, and documents should be treated as evidence ((Flower, Grimsditch, 2015).

Table 2: Land tenure categories ((Flower, Grimsditch, 2015).)

<table>
<thead>
<tr>
<th>Tenure Category</th>
<th>Explanation</th>
<th>Strength of Possession Claim</th>
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|   | Not on state public land.  
Occupation began pre-2001.  
Hold a tenure document but dated after 2001. | Property is not located on land classified as state public.  
Household began their occupation before 2001 and have a tenure document but it does not show that their possession commenced before 2001. | Potentially legitimate claims to legal possession, but will have to rely on other forms of documentation (such as Family Book) to prove that possession began pre-2001. |
|---|---|---|---|
| C | Not on state public land.  
Occupation began pre-2001.  
Do not hold any tenure document. | Property is not located on land classified as state public.  
Household began their occupation before 2001 but do not have any tenure document. | Potentially legitimate claims of legal possession, but may have to rely on other forms of documentation (such as Family Book) to prove that possession began pre-2001. |
| D | Not on state public land.  
Occupation began post-2001. | Property is not located on land classified as state public.  
Household began their occupation after 2001. | Potentially legitimate claims of legal possession, but may have to collect documentation that shows a chain of possession going back to pre-2001. |
| E | Plot appears to overlap state public land. | A portion of plot appears to be located on land classified as state public, and a portion on land that is not classified as state public. | Potentially legitimate claims of legal possession for land that is not classified as state public if occupation began pre-2001. Household cannot claim possession of any land that is classified as state public. |
| F | Plot appears to be on state public land. | Household’s entire parcel (or vast majority of it) is on state public land. | Household is unlikely to be able to claim legal possession as they appear to be located on state public property. |

4. Case study Chrang Chamres:

4.2. About Human Rights Based Spatial Planning project

The HRBSP concept has been developed by PIN and STT as a result of the evaluation of STT previous work and it builds on that extensive experience. The project aims at developing and promoting good practices in spatial planning and urban poor settlements upgrading among all actors: local authorities, and communities, private sector, civil society organizations and others. It consists of the following elements:

- Supporting Phnom Penh municipality led Urban Poor Poverty Reduction Working Group in developing policy papers and good practices in urban poverty reduction
• Mapping, enumeration and legal analysis of land status in the urban poor communities in Phnom Penh
• Documenting land and property claims using innovative data collection mapping applications
• Community organizing, participatory planning for on-site redevelopment and small scale infrastructure improvements and linking these efforts with Commune Development and Investment Plans
• Supporting Community Based Organizations with small grants
• Improving solid waste management practices in the urban poor communities
• Promoting good practices in spatial planning through Spatial Planning Lab- 9 weekends course for students and professionals.

The first phase of the project was implemented by PIN and STT in 2014-2015. The second phase of the project is implemented by PIN, STT, Open Institute (OI) and Urban Poor Women Development (UPWD)

4.1. Chrang Chamres case study

Sangkats Chrang Chomres 1 and 2 in Khan Russei Keo are located along the western bank of the Tonle Sap River and home to 12 poor communities. The selected area for HRBSP 1 project is populated by 1295 Cham Muslim families. In the area selected for the second phase 750 families live. Systematic land registration has not taken place in this part of the town, and while the residents do not report active threats of eviction, it is considered at risk due to its location between National Road 5 and the river\(^2\). South of the location of the target communities, residents have already been threatened with eviction due to development of the riverside into a public park. Similarly, residents on the eastern bank of the river have already been evicted as part of “rehabilitation” efforts. Residents in Chrang Chamres 1 and 2 report poor sanitation and infrastructure as key challenges, including general indebtedness and poor access to services. In the past, the densely populated area has also been subject to extensive fires. Spatial redevelopment planning in this area was considered to produce practical steps for public interest upgrading of the area with concomitant respect for the rights of existing residents.

\(^2\) Rivers and the riverside areas (considered to the highest inundation point during rainy season), lakes and roads’ reserves are considered a state public property which cannot be occupied by settlers (Land Law 2001).
4.1.1. Legal land survey in HRBSP 1.

During the preparation of the project and based on the previous lessons learnt in providing communities with legal services, it was decided to provide each household with unique sets of documents describing their legal situation in detail. The distributed package included:

- Map of the claimed plot by household
- Community map
- Data sheet with details regarding land claim and household
- Legal advice sheet based on the provided data and location of the plot

The main advantage of this solution is that families could understand better their individual situation rather than deal with fairly vague and at times inadequate information provided for the entire community. The main assumption has been that in case of eviction community members’ negotiation position would be stronger and they could use it in the court of law. Collectively they could also use the information and advice to take pro-active steps to improve their land tenure security.

The process required substantial human resources. Legal consultants were engaged in the project initial phase to define questionnaires, determine and describe land categories and prepare legal advice which would be understandable to residents of Chrang Chamres. 1295 legal advice packages were prepared in English and Khmer. It has been estimated it took approximately 12 hours to prepare one full package for a single family. Moreover, numerous errors occurred during the production process, which had to be fixed manually and this also added time to complete the process. Another significant disadvantage was that once data is entered it is very difficult to change and update it, turning the whole effort into one-time exercise.

4.1.2. Legal Land Survey-HRBSP 2

The HRBSP 2 project targets 530 families living Chrang Chamres 2. Based on the experience of HRBSP 1 project, the consortium decided to automate the process of data collection and production of land tenure reports and legal advice sheets as well as improve their clarity by further simplification of the language. One of distinctive features of iTenure is that it generates voice files containing legal advice. The functional literacy among Chrang Chamres residents is limited and voice based content proves to be quite effective in behavior change in Cambodia as demonstrated by other PIN projects (e.g. mHealth). By calling a dedicated phone number, and entering individual code, community members can listen to their legal advice sheets at any time. However, the biggest advantage of iTenure is reduction of time which is needed to produce the
The following are the results of the post distribution survey among randomly selected community members:

The results of the survey demonstrate that Legal Advice sheets have been better received by the beneficiaries of HRBSP 2 project. The understanding of the messages and perception of usefulness greatly improved. When asked for details people were declaring they understand their situation better. The fact that local authorities participated in the process of explaining land categories and legal advice sheets was a good opportunity to start discussing about the future of the settlement which became an entry point for preparation of on-site re-development plans.

5. Why iTenure

The fact that the same parts of the land law were being applied over and over for the drafting of the different Legal Advice Sheets (LASs) led to considering automating their production. It was proposed that it was possible to create a computer system that would generalize and integrate all the knowledge on this topic from a specialized land lawyer in the form of rules. The system would be fed the basic information about each claim and would automatically produce the LASs.
An analysis of the necessary information for the drafting of the individual Legal Advice Sheets (LASs) showed three separate information sources: the claimant, maps, and land laws.

The claimant provided information about the location of the claim, the length and quality of the occupation, as well as documents that demonstrated this occupation. The maps provided information on the type of land in which the claim was located: being located in private state land would allow the dweller to have property rights over the claim, while a property located in public state land (roads, waterways, etc.) would not be defendable under the law (see chapter 1 for details). The law and its interpretation provided the legal framework that needed to be applied individually and reflected in the LASs.

iTenure, a multi-component computer system, was designed to collect the necessary information from claimants, analyze existing maps to determine the type of land, and draft individuals’ reports based on this information and on the land law. As dwellers were not expected to understand legal terminology, iTenure also created for each claimant a report in voice format using colloquial language, and provided it to the claimant through an automatic calling system (IVR) in which claimants could call, enter their document number, and listen to the explanation of the situation of their claim in terms they could understand.

In all cases the tendency in the project was to attempt to reuse existing software and standards whenever possible, developing new elements of new software only when necessary.

2. Process

Open Institute worked with the other members of the HRBSP 2 consortium and with a land tenure expert to understand the different data points that would be needed for the automatic generation of the LASs and the voice reports. These included data on the claimer, the property itself, connection to municipal services (water, electricity), property documents, and any other document that could support the fact that the claimer had lived there in the past.

The team used 6 land tenure categories as described in table 1 (see context section for details):

Each of these categories had different “shades”, depending on documents available. A claim that was well documented would be much stronger than the one that could only be documented through witnesses.

Rules were developed to define which text should be part of a specific report depending on documentation available or other factors.

The creation of the reports has four stages:
Data collection.

Based on the data collected, and on the location of the claimed property (inside private state land or not) one of the categories would be selected, which would lead to select a template document for that category.

The template document would then be personalized for that claim, selecting only the pieces of text that correspond to the data collected about that property. Individual variable values (such as the name of the claimer) would also be included in the report. Finally, a map of the location and its surrounding area would be generated and also included. As a result, a specific personalized report for that property would be generated in PDF file.

As a third step, the same process would be followed to generate a voice file report with equivalent information, but in easy-to-understand colloquial language. The data would be used to select short voice files that would be put together, creating a single voice file that would become available through a phone call from the claimer.

Modification of the data through the systems dashboard would lead to automatically updated versions of these reports.

In preparation of this work, STT created the maps of state public land in the selected areas, mapping roads and waterways, and People in Need created detailed photographic geo-referenced images of the areas using a UAVs (ebee RTK).

3. Selection of data collection, centralization, storage and management tools.

In order to have sufficient information to generate the LAS, the data collection used system needed to be able to collect not only basic data from the claimant, but also the location of the property, either using GPS or by finding the property in aerial pictures of the area. Information had to be stored in a cloud system that allowed modification after collection, as well as simple access form other system. For data collection using tablets several existing open source systems where available. Not all of them fulfilled all these characteristics. Their specifications were carefully studied, even if it was not possible, due to time and resource constraints, to do deep testing of each one of them:

- **MAST** - an open-source mobile application that can capture the information needed to issue formal documentation of land rights. Coupled with a cloud-based data management system to store

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3 [https://github.com/MASTUSAID/](https://github.com/MASTUSAID/)
geospatial and demographic information, the project (funded by USAID) is designed to lower costs and time involved in registering land rights and, importantly, to make the process more transparent and accessible to local people. The project was implemented in rural Tanzania working directly with villagers to map and record individual land rights, strengthen local governance institutions, and build government capacity.

- **STDM** is a tenure registration tool built from the STDM prototype version UN-Habitat/GLTN together with its implementing partners, which have supported the continuous development of the information tool in a variety of application areas ranging from informal settlement upgrading to natural resource management. The concept of the Social Tenure Domain Model (slightly different from the ISO-approved Land Administration Domain Model - LADM) is to bridge this gap by providing a standard for representing ‘people – land’ relationships independent of the level of formality, legality and technical accuracy.

- **GeoODK** is a phone-/tablet-based application that provides a way to collect and store georeferenced information. It is supported by a suite of tools to visualize, analyze and manipulate ground data for specific needs. The application was derived from the Open Data Kit developed by University of Washington. Both online and offline mapping component were added to it, as well as some addition spatial widgets, including a developer option for deploying surveys with the app.

- **Open Tenure** is a mobile application that allows citizen recording of tenure rights. People designated as Community Recorders use their mobile device in the field to record details of a tenure right claim describing the tenure right and all owners (right holders) and a map of the boundaries of the land claimed. Photos of the owner(s), the land claimed and supporting documents can captured and linked directly to the claim. When the recording of a claim is complete, the Community Recorder uploads a claim to the Community Server for community based review and moderation. The Community Server web application also publishes “community recognized” tenure rights and can generate a certificate for owners of a recognized tenure right. Open Tenure is designed to work where internet connections are unavailable or unreliable. Open tenure an Community server are part of a wider range of cadastral tools developed and supported by the Food and Agriculture Organization of the United Nations (FAO).

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4 Source: http://www.knowedge.co.uk/Third_update.html
5 http://stdm.gltn.net
6 http://geoodk.com
The combination of Open Tenure and Community Server was selected as the data collection platform for several reasons:

- It allowed capturing both claimant information (through a survey) and location information by either using GPS or marking the location of the claim in a map.
- It could capture data offline and then send it to the server.
- It could display in the tablet all the other claims that had already been captured by any of the data collectors (after they uploaded).
- It allowed, through configuration, adding all the necessary fields of information to the data collection tool.
- As Open Source, it was possible to also eliminate fields that in the original application were considered mandatory, but would not be of use in our case, producing only confusion.
- Its installation and use was very well documented.
- It was possible to discuss with team of tenure experts and developers accessible who could support the effort if needed, as well as with FAO staff, facilitating the process.
- It allowed analysis and vetting of the information by authorized community officials through its Community Server, supporting community conflict-resolution processes.
- A preliminary translation of the data collection tool to Khmer language had been made.
- By using the open source Geoserver server\(^7\), it allowed charging to the tablet the high-definition geo-referenced aerial photographs that would be used to very precisely determine the location of a claim.
- It also allowed the use (in the tablets, while collecting information) of map layers with information about roads, waterways and other geographic locations that could be used as reference. It was also possible to preliminarily draw the claims in into a separate layer (on top of the aerial picture), and use this layer as part of the data collection process (as in this case locations would be drawn in a computer, location could be more exact that selecting points in the tablet).
- Having already the Geoserver GIS package installed and having the claims there it was possible to also include the maps (shapefiles) of the public state land, so that it could later be determined if a given claim was fully or partially in public state land.
- The basic data that it captures is aligned with the ISO-approved Land Administration\(^7\) Domain

\(^7\) http://geoserver.org. Its developers define it as “GeoServer is an open source server for sharing geospatial data.”
Model (LADM)

The use of Open Tenure / Community Server requires the installation of three packages:

**Open Tenure:** Data collection tool for Android tablets. If can collect survey data (text fields, images, numbers, etc.) as well as location information by either using GPS or by pinpointing the location of a claim in a map (selecting the points that mark the perimeter). It is configured to a specific type of data collection by configuring the **Community Server** it is connected to. Open Tenure reads the configuration and collects data based on the fields included in the **Community Server** configuration. It can do data collection off-line, and then send the information to the **Community Server** when an Internet connection becomes available. It can use different types of maps that it receives from the map server (**GeoServer**).

**Community Server:** a cloud server in which

- It is possible to configure the type of information that the users wish to collect through Open Tenure.
- It keeps the information on claims collected and sent by Open Tenure tablets, and makes it available to community authorized veters, who check for conflicts and approve the information when it is clear.

**GeoServer:** a cloud mapping server that keeps mapping information and geo-located aerial pictures, and serves them to Open Tenure when requested.

4.- **Technology application and development.**

The ability to easily replicate the project in different countries or different legal frameworks, as well as in other languages, was the first technical requirement of the project. This meant that all variables used, templates, and their use should be configurable without having to resort to programming.
The first component of the project are the data management and data collection tools: Open Tenure and Community Server.

These two closely coordinated tools have a basic number of data points (pieces of information) that are mandatorily collected (what is called the default form). Additional pieces of information can be collected by creating the Community Server what the application calls a dynamic form. This new form can include fields of different types, including pictures. Both forms are downloaded to the Open Tenure application in a tablet, functioning as a single set of questions for the claimant.

Open Institute created the dynamic form including all the required data for this project. From the default form it kept some of the fields, and modified the Open Tenure application so that default fields not used would not be seen by the users. It also translated the application to Khmer language.
In addition, Open Institute modified the application so that the user could download to the tablet all the maps of the area that she or he was going to work in, in order to then work completely offline.

The third tool required for the use of Open Tenure is GeoServer, a cloud based open source server package that is used to store, manage and serve when required maps and geo-referenced images.

At the first stage GeoServer was only used to store maps and images that would be used by Open Tenure. Later, for the development of the LASs it would be used to determine on what type of land (public or private state land) a claim was located.

People in Need took detailed geo-referenced aerial images of all the areas in which the work was going to take place, and these images were uploaded to the GeoServer, to be used by Open Tenure. The high-definition images made determination of the location of the properties much easier.

With the data collection data in place, Open Institute first started to work out on the template documents that would be the base for writing the reports. It was decided to use the ISO standard Open Document Format as the base (OpenOffice documents), and created a language that allowed it to describe where the value of a given variable should be placed, or if a picture or a text should be kept in the final document, depending on if specific conditions took place (related to values of the variables).

All the know-how on the Cambodian Land Law was used to define which parts of the text should be included in each case. The result was seven templates that could be adapted to any case considered, and which would be personalized taking into account the values of the variables. The templates also indicated where the map of the claim or other documents should be placed inside the document. The templates were equally developed in English and Khmer.

With these templates in place, Open Institute developed the application (iTenure) that would define which template should be used (based on variables of the particular claim, and on information about the type of land from GeoServer), and then apply the necessary changes to the template to create the actual Legal Advice Sheet for that case in Open Document Format. The document would then be immediately converted to PDF format. As the templates existed in both English and Khmer, both documents would be generated.

Once the text documents are generated, iTenure also generates the equivalent sound file. The format of this file is simpler, not including personal data of the claimer (his/her name and other personal data would have to be specifically recorded for this), but giving in colloquial language the main information contained in the textual report.
All the possible sentences that could be included in the reports were recorded, and, once again, to reuse the same code, Open Document Format (ODF) documents that contain all the templates for these sound advice files were created. These ODF documents do not contain clear text, but only the filenames of the voice files that could be included in the document. The same mechanism used to select which text should be included in the textual reports is used in these files to determine which files names should be kept in the file or deleted, depending on the values of the variables of the claim. Once the template is processed for a specific claim, the result is a list of voice files that should be concatenated together and which together make the personalized voice reports for that claim. Then one more process simply concatenates this files into the report for that claim, creating a single voice file. The voice reports are then kept in the iTenure server.

As the last part of the system, Open Institute has developed an automatic phone call system (IVR, or interactive voice response) that allows the users to call a given number, enter their claim number, and listen to the specific voice report for that name. Both the phone to call and the claim number are included in the textual report.

The system allows selected staff to edit data from the claims. Once the data is saved, the system automatically generates a new LAS textual report based on the new data, as well as an updated sound file, which becomes immediately available through the IVR system.

5.- Replication

As mentioned before, iTenure has been defined to be easily adapted to different countries, languages or legal frameworks.

Its adaptation requires three major tasks:

a.- Understanding and implementing the legal framework.

This work should be done with the support of a lawyers who has deep knowledge and experience on the legal framework and its application in relation to land laws. The following sub-tasks are required:

a) Identifying the major categories of land ownership rights in which a claim can fall into.

b) The legal knowledge is used to define the data points (variables) that needs to be collected about each claim in order to be able to create Legal Advice Sheets. This data will fall into three categories.
   - Primary variables. They will help determine the category a claim should fall into (e.g., years
of occupation).

- Secondary variables. Will determine the specific advice that is given within a category (e.g., having a national ID prior to 2001 mentioning the address of the claim).
- Tertiary variables. Provide additional information that is placed in the Legal Advice Sheet, but does not change the advice (e.g., gender of claimant).

c) Once the categories and variables are defined, then templates need to be defined for each one of the categories. The templates are OpenOffice documents in which all possible text and images that could be included in the Legal Advice Sheet for the given category are included. The format of the document is also simply done using OpenOffice. Then the project's mark-up language is used to describe in which circumstances each piece of text should be part of a Legal Advice Sheet.

d) Once the files are completed, then the only piece of code necessary for the adaptation needs to be written. This piece of code looks at the variables (and maps if necessary) and determines in which category a given claim falls. Before the end of this project this part will also be converted to a ODF document with the same mark-up language used for templates, so that no programming will be necessary for adaptation.

e) Finally, the written templates need to be turned into colloquial language scripts that can be recorded for the voice reports. Not all the information is included in the voice reports, only the major points that allow the claimants to clearly understand the situation their house is in, and their rights within the present law. Some parts of the script will always go as part of a given category, but others will be optional. The script is divided into these mandatory and optional pieces, and each piece is recorded into a sound file. Then an OpenOffice (ODF) template is created for each category. The template does not contain the text itself, but only the filenames of the sound files that contain the different parts of the script. The mark-up language is again used to define in which circumstances each part of the script (a filename) should be kept as part of the final voice advice and which parts should be eliminated (advice not valid for this case), based on the variables.

Reports created must be thoroughly tested before such reports are generated for real cases and handed to claimants.

b.- Defining and finding, buying, or producing the necessary imagery.

In general, some sort of maps of the area where the claims are located will always be necessary.
GPS has the precision to determine where a point is within a distance of a few meters (around 10 meters in general). It is usually considered insufficient to clearly draw the situation of a claim; it is much better to locate the claim in a geo-referenced satellite image of sufficient resolution. Openly available satellite images (such as Google Maps) usually do not have sufficient resolution to determine the situation of a claim (errors for each point could range from 1 to 5 meters, depending on the resolution of the images).

It is possible to buy satellite images of higher resolution from companies such as GISAT\(^8\). Images with resolution of 0.3 to 0.4 meters per point would be sufficient for most cases (it is possible to have an error of 1 meter or less in the determination of a point).

For more exact measuring, as in the case of this project, where slum-type houses are sometimes present, a higher resolution is necessary, and the best way to obtain these images is by using drones that will take high resolution geo-referenced images of the area, in which individual persons are clearly seen, providing sufficient accuracy to clearly delimit the perimeter of a claim.

3.- Installing and adapting the software packages.

In order to implement a similar project, the organization doing it must implement (or have others implement) the following steps:

a) Installations
   - Install the Community Server package in the cloud.
   - Install the GeoServer package in the cloud.
   - Install the iTenure package in the cloud.

While also well documented, a minimum level of systems engineering knowledge is necessary to make these installations.

b) Configuration

Community Server will have to be configured to accept all the data points that are required for the decisions regarding selection of categories, selection of text within these categories, and all other information that needs to be included in the LASs. The working language will also have to be defined in the Community Server, doing the necessary localization if the work language is not present in the system already.

\(^{8}\) [http://www.gisat.cz/content/en](http://www.gisat.cz/content/en)
The necessary images will have to be uploaded to GeoServer, in layers, so that they can be used to either help support decision on the type of land (public or private state land in the case of Cambodia).

In iTenure all the variables from Community Server that need to be used will be configured, and the text and voice templates will be uploaded, together with the voice files. The code for selection of categories will be integrated.

Open Tenure for Android can be downloaded from the Google Play store, then it needs to be configured to Community Server, and prepared for the language in which data collection will take place. It will then be ready to collect all the data on claims and send it to the Community Server. In our experience it is better to compile a new version of the software that already has all the necessary configuration for the project, and then upload this copy to Google Play as a separate application, so that it can be downloaded and used by data collectors.

Voice system. Open Institute has created a complete IVR system that is used for disseminating the voice files of this project, but this is harder to reproduce. It is recommended that a local IVR service is used for this purpose in each country.

c) Data collection
Data collection must be carefully planned depending on the social and political situation in the country. It is important to collaborate when possible with local authorities, creating an environment in which data collection takes place and dwellers trust that the data collection will not end in problems for them.

Data collectors must be carefully trained to use the tool, understanding well all the questions included, and having acquired practice on the use of the mapping tool, selecting the points that mark the perimeter of the claim.

d) Report generation
Depending on the community vetting process that is being followed, the information will not be considered as final until approved by the authorized community representatives. This means that LASs cannot be provided to the claimants immediately after data collection. All reports can be generated together after the vetting process is finished, and distributed to the claimants.

Conclusion
Legal education and awareness programs are very important in the process of legal empowerment of people under threat of eviction and/or without secure land tenure. The past experiences from Cambodia such as the case of Dey Krohom or Baung Kak Lake demonstrate that confused, misinformed and manipulated individuals and communities are unlikely to be able to defend their rights effectively by referring to local legal frameworks. On the other hand, those individuals and communities which are aware of their rights and legal mechanisms tend to be better negotiators and are offered better compensation packages.

With this in mind, projects such as HRBSP aim to legally empower people so they become real stakeholders with strong claims capable to shape their future in informed manner. Technological innovations can accelerate these processes allowing CSOs and governments to reach and assist thousands of people in relatively short time.
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