Can blockchain technology be an answer to India’s land governance woes?

Anyone who has watched Dibakar Banerjee’s comedy drama, *Khosla ka Ghosla*, knows the nightmare of Kamal Kishore Khosla when his land—bought out of hard earned ‘middle class’ income—is usurped by the land-shark Kishen Khurana. Khosla’s original land ownership papers are no match for the forged papers created by Khurana. No prizes for guessing that the judicial process to reclaim land would have been far more complicated and Khosla would almost certainly have failed to convince the courts due to the lack of ‘confirmed titling’. As a result, the movie shows his sons attempting to ‘buy’ their land back from Khurana. The brilliant plot provides only a glimpse of the complex world of land conflicts, which is a cause for stalling of investments to the tune of Rs12 trillion in India. But it nudges us to ask why we have a land titling problem?

The apparent reason is an archaic piece of legislation, The Registration Act, 1908 that allows only ‘presumptive’ ownership. A registration in India is a mere record of the sales transaction—and is liable to be challenged in courts. Why cannot a ‘confirmed ownership’ be conferred, one may ask? Because nobody can be certain as to how many ‘hands’ a piece of land has passed through. Put simply, it’s an information problem, which makes verification of ownership and assignment of a unique identification prohibitively expensive.

At present, a ‘title’ can be established only through a chain of transfer documents beginning from the first owner. However, the onus is on the buyer to examine all the link documents tracing up to the original owner. This is, of course, a tough exercise due to difficulty in accessing all the historical records.

Therefore, two remedies are needed: first, titling of a land unit needs to be confirmed with one owner. Second, there needs to be a clear trail and record of all transactions done regarding the unit. Recent governments have recognized the need for simplifying land governance, primarily aimed at digitizing land records. In 2008, a short-lived National Land Records Management Programme was launched, which failed due to implementation hurdles.

The current government has recently renewed the push for making all land records and titling digital through the Digital India Land Records Modernization Programme (DILRMP). While a digital footprint is certainly an improvement over a physical ledger of records, certain vulnerabilities will persist such as conflicting claims on ownership; bribery and corruption in altering registered data; bureaucracies around third-party vetting; and cyber-attacks and data theft.

Is there a way where every land unit can be assigned a unique identification, every transaction has a fingerprint, and the data is secure and immune to duplication and hacking? Enter blockchain. In its simplest form, blockchain is a distributed ledger record of transactions.

First, it is decentralized and stores data in a nearly incorruptible form, providing a dashboard view of data to any vested party, at much lower costs and several times better accuracy. Second, blockchain technology can be used to confer a unique cryptographic identifier to each land parcel based on its geographic coordinates, ownership, and purpose of usage.

For example, an agricultural land parcel owned by a farmer in Punjab may be assigned a unique identifier and any changes in the land are also assigned different identifiers. If the property of the farmer is divided between his two sons, there will be a change in the geographic coordinates and ownership. Now, if one of them decides to build a resort on his piece of land, there will be a change in the purpose of usage as well. Thus, each change in land attribute will be accorded a fingerprint of its own based on the transaction type. This will interact with the stock land identifier to create a chronological trail of transactions that can be retrieved anytime by classified users. The

important thing here is that because of the cryptographic nature of blockchain technology, it cannot be corrupted by any viewer of the distributed ledger.

This is like a website, where a visitor cannot alter the contents of the site unless they hold the access key. Blockchain-enabled ledgers have a public key spread over a network of millions of computers. In other words, hacking a code will require hacking of that many systems—a nearly impossible feat. With this enhanced security feature, a unique record of existing land distribution and transactions on a near real-time basis can be reflected singularly to each vested party without any centralized control.

Once land records overcome the security and entitlement issues, benefits can be enormous, ranging from farm tenure security to farm land contracts to credit-worthiness of real estate. However, implementation of blockchain technology will require legal and infrastructural support such as a firm Land Titling Act, a single department for land registration and records, higher rural literacy, third party information technology (IT)-enabled support and creation of a public key infrastructure trust (PKI) to take care of digital certificate management (as pointed out by Meghna Bal in an Observer Research Foundation report). There will still be challenges at the point of freezing a confirmed ownership title as it cannot be guaranteed that the title is dispute-free.

However, it can secure the future through conversion of land records from physical to an online ledger system stored in a secure environment, with private user access and public visibility. The need for a bureaucratic third party—land departments—will be eliminated as every landowner can get total control over the titles. Buying and selling of land will boil down to only exchange of information at the negotiated price—all of which would be recorded in a tamper-free online system, forever.

There are many dimensions of land reforms in India of which titling is, probably, the most urgent. Blockchain technology is no short-cut, but in combination with other institutional reforms, clearly offers a feasible solution. Given the central government's appetite for digital transformations it is hard to imagine a better time for aggression on this front. Kamal Kishore Khosla and everyone who empathized with him would definitely agree!

Ranjan Kumar Ghosh is assistant professor, Centre for Management in Agriculture, Indian Institute of Management Ahmedabad (IIMA); Vipul Patel is vice president-investments, Centre for Innovation Incubation and Entrepreneurship, IIMA.

This article presents the authors' personal views and should not be construed to represent the institute's position on the subject.

END