Accessibility of Agricultural Land Records in India

Policy Brief No. 3 | 2022 | Authors: Aswani Kumar Munnangi[1], Somnath Sen[2], and Deepak Sanan[2]

1. The Context

The Government of India launched the National Land Records Modernization Programme (NLRMP) in 2008 by unifying the Computerisation of Land Records (CLR) and the Strengthening of Revenue Administration and Updating of Land Records (SRA and ULR) programmes, in order to accomplish the goal of improving the quality of land records across all States and Union Territories (UTs) of the country. Later in 2016, the NLRMP was brought under the "Digital India" initiative and renamed as the Digital India Land Records Modernization Programme (DILRMP). The programme guidelines clearly prioritise focus on the services that citizens ought to benefit from as a result of digitisation of land records. Accessible land records allow owners to verify their details and apply for corrections if discrepancies are found. This is likely to clear disputes, save time and resources, and finally improve the quality of land records. Since land is the essential commodity for property markets, access to improved and accurate information available from the land records will spur economic activity while providing protection to owners, sellers, and buyers.

As in the other sectors, in land records management, paper-based records were the norm until the advent of the Information Technology revolution in the 1990s. With the States and UTs moving to digitisation, it became possible to access land records where available, remotely through the Internet. By the late 2000s, India also witnessed the launch of smart mobile phones. The current number of active Internet users (624 million) and active mobile Internet users (572 million[1]) is projected to grow rapidly in the coming years, with a lot of growth coming from the untapped rural areas and smaller towns). With digital identity also available to more than 1.2 billion Indians, the availability of Internet via computers and more importantly, affordable mobile phones, poses a huge opportunity to make available land-related information to citizens, in a swift, accurate, and economical manner, obviating the need for travelling to peruse physical records. For this to happen however, the records must be easily but securely accessible, comprehensive, easy to view and navigate, and enabling users to seek help if needed.

The NCAER Land Records and Service Index (N-LRSI) 2020 and 2021 measured: i) the extent of digitisation of

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[1] Various estimates project growth to exceed 900 million for Internet users and 650-700 million for smartphone users by 2023 (Digital India Report, McKinsey, 2019). Estimates from other sources, for example, the CISCO project, point to higher

numbers for both categories (*Business Standard*, February 18, 2020). Current estimates are from https://www.statista.com/statistics/309866/india-digital-population/.

land records and services and ii) the improvement in the quality of the record as a result of the digitisation process (the index is focused on rural land records). These indices also showed that mere digitisation of records does not automatically translate into accessibility to these records for citizens. The DILRMP will be effective and successful only if the land records and associated services are easily accessible to the public. Accessible land records will also open land markets as they induce confidence among the buyers as details such as the location of land, the rightful owner of land, existing claims, and disputes, if any, on the land are available online. As of December 2020, under the DILRMP, 28 States/UTs designed and hosted websites for the Record of Rights (RoRs), 22 States/UTs have sites for Cadastral Maps (CMs), and 27 States/UTs have Circle Rates (CRs) data online. Citizens can access these websites/data to understand their land records and benefit from the allied services. Table 1 presents information about the online availability of RoRs, CMs, and CRs in different States/UTs.

The N-LRSI 2020 study drew attention to the problems and obstacles faced in accessing land records and allied services provided by the websites of the States/UTs. The assessment measured the following indicators of the websites: Ease of Access to Server and Documents; Timing and Time Taken; Simplicity and Language; and User Interface. However, no attempt was made in N-LRSI 2020 to compile the above into a summary index. But an Accessibility Index was developed in the second N-LRSI 2021. This policy brief outlines the key features of this Index, and presents the results of the analysis of the State/UT land portals, along with some recommendations to improve the accessibility of these records to the public.

2. Accessibility Index Design

There are variations in layout, navigation, and technologies used in the designing of website by States/UTs in the country. However, irrespective of any variations, the websites are expected to provide accessible information and services to all the citizens. To achieve some sort of standardisation across Government websites and portals, the National Informatics Centre (NIC), under the Ministry of Electronics and Information Technology (Meity), Government of India, formulated *"Guidelines for Indian Government Websites"* (GIGW), First Edition in 2009. An improved version of the guidelines was launched in 2019 (GIGW 2.0) by considering the advancements in technologies and usage patterns. These guidelines aim for standardisation and uniformity in all Government websites and are based on:

- ISO 23026 Standard;
- International Web Content Accessibility Guidelines 2.0;
- India's Information Technology Act, 2000; and
- Rights of Persons with Disabilities Act, 2016.

Table 1: Online Availability of RoRs, CMs and CRs in States/UTs across India

S. No.	States/UTs	RoRs Availability	Cadastral Maps Availability	Circle Rates Availability
1.	Andaman & Nicobar Islands	✓	✗	✓
2.	Andhra Pradesh	✓	✓	✓
3.	Arunachal Pradesh	✗	✗	✗
4.	Assam	✓	✓	✗
5.	Bihar	✓	✓	✓
6.	Chandigarh	✗	✗	✓
7.	Chhattisgarh	✓	✓	✓
8.	Dadra & Nagar Haveli and Daman & Diu	✓	✗	✓
9.	NCT of Delhi	✓	✓	✗
10.	Goa	✓	✓	✓
11.	Gujarat	✓	✓	✓
12.	Haryana	✓	✓	✓
13.	Himachal Pradesh	✓	✓	✓
14.	Jammu & Kashmir	✗	✗	✗
15.	Jharkhand	✓	✓	✓
16.	Karnataka	✓	✓	✓
17.	Kerala	✓	✓	✓
18.	Ladakh	✗	✗	✗
19.	Lakshadweep	✓	✓	✗
20.	Madhya Pradesh	✓	✓	✓
21.	Maharashtra	✓	✓	✓
22.	Manipur	✓	✗	✗
23.	Meghalaya	✗	✗	✗
24.	Mizoram	✗	✗	✗
25.	Nagaland	✗	✗	✗
26.	Odisha	✓	✓	✓
27.	Puducherry	✓	✗	✓
28.	Punjab	✓	✓	✓
29.	Rajasthan	✓	✓	✓
30.	Sikkim	✗	✗	✓
31.	Tamil Nadu	✓	✓	✓
32.	Telangana	✓	✗	✓
33.	Tripura	✓	✓	✓
34.	Uttar Pradesh	✓	✓	✓
35.	Uttarakhand	✓	✗	✓
36.	West Bengal	✓	✓	✓
	Total Availability	*28*	*22*	*26*

Source: Authors' review of the State level websites (Status as of December 2021).

Note: ✓ = Available; ✗ = Not available.

As part of the N-LRSI 2021 study, an Accessibility Index was designed based on GIGW 2.0[2] and the land record portals of all the States/UTs (related to RoRs, CMs, and CRs) were assessed on the basis of various indicators to measure their progress in making the land records and related services accessible to the public.

As mentioned earlier, the proposed Accessibility Index features the following four broad indicators:

i.   Ease of access;

ii. Comprehensive information;

iii. Website design and navigation; and

iv. Help/customer care indicators.

2.1. Scoring Mechanism of Different Proxy Indicators

Each of the four features/indicators has been accorded equal importance for reasons of simplicity, that is, contributing 25 points for a total of 100 for the Accessibility Index, with the score ranging from zero to 100. As each indicator cannot be computed directly, proxy indicators are defined. The proxy indicators and their corresponding computations are provided below.

2.1.1. Ease of Access (25 points)

In order to evaluate the ease of access, which is an operation feature, the following five proxy indicators have been considered:

- Website loading time for RoRs, CMs, and CRs;
- Number of attempts to access the content for RoRs, CMs, and CRs;
- Content loading time for RoRs, CMs, and CRs;
- Accessibility on different mobile bandwidths (2G, 3G, and 4G); and
- Accessibility on mobile phone.

2.1.1.1. Website loading time (5 points)

The loading time for RoR, CM, and CR websites with equal weightage has been assessed under this proxy indicator. Points are awarded by following the checks listed in Table 2.

2.1.1.2. Number of attempts to access the content for RoR, CM, and CR (5makrs)

The number of attempts to access the content of RoRs, CMs, and CRs has been assessed under this indicator. Equal weights are assigned to access RoRs, CMs, and CRs. Points are awarded on the basis of the constraints delineated in Table 3.

Table 2: Allotment of Points for Website Loading Time

S. No.	Condition	Points Awarded
1.	Loading time is 5 seconds and below	Full points – 5
2.	Loading time is from 6 to 10 seconds	20% penalty – 4
3.	Loading time is from 11 to 15 seconds	40% penalty – 3
4.	Loading time is from 16 to 20 seconds	60% penalty – 2
5.	Loading time above 20 seconds	80% penalty – 1
6.	Not loading	100% penalty – 0

Source: Authors' specification.

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[2]A plethora of website accessibility guidelines and evaluation methodologies are used by different agencies for different uses. This index followed the GIGW 2.0 since this has been developed and mandated by the Government of India for all government websites and portals.

Table 3: Allotment of Points for the Number of Attempts to Load the Content

S. No.	Condition	Points Awarded
1.	Single attempt	Full points – 5
2.	2 to 4 attempts	25% penalty – 3.75
3.	5 to 9 attempts	50% penalty – 2.5
4.	10 attempts and above	75% penalty – 1.25
5.	Not accessible	100% penalty – 0

Source: Authors' specification.

2.1.1.3. Content loading time of RoRs, CMs, and CRs (5 points)

The content loading time of any random RoR, CM, and CR has been assessed under this proxy indicator. Equal weights are given to the loading time of RoRs, CMs, and CRs. Points are awarded by following the checks presented in Table 4.

Table 4: Allotment of Points for Content Loading Time

S. No.	Condition	Points Awarded
1.	Loading time is 5 seconds and below	Full points – 5
2.	Loading time is from 6 to 10 seconds	20% penalty – 4
3.	Loading time is from 11 to 15 seconds	40% penalty – 3
4.	Loading time is from 16 to 20 seconds	60% penalty – 2
5.	Loading time above 20 seconds	80% penalty – 1
6.	Not loading	100% penalty – 0

Source: Authors' specification.

2.1.1.4. Accessibility of RoRs on different mobile bandwidths - 2G, 3G, 4G (5 points)

Under this proxy indicator, tests have been conducted to assess whether the RoR content can be accessed on the laptop under different mobile bandwidths (2G, 3G, 4G). If the content is accessed on a particular bandwidth, then full points are given, else zero. Finally, a cumulative score is obtained by considering equal weights for every bandwidth.

2.1.1.5. Accessibility on a mobile browser (5 Points)

Under this proxy indicator, tests have been conducted on the accessibility of the RoR, CM, and CR content on a mobile's default browser. In the case of Android, the mobile content is accessed in a Chrome mobile browser, and iPhone content is accessed in a Safari mobile browser. If the content is accessed on the mobile browser, full points are given, else zero. The final score for this indicator is obtained by considering equal weights to the accessibility of RoR, CM, and CR.

2.1.2. *Comprehensive Information (25 Points)*

The following four proxy indicators have been used to measure the comprehensive information that is a perceivable feature of accessibility:

- Operable across different browsers—no change in information, navigation buttons, and functionality;

- Website availability in two languages;

- Document availability in two languages; and

- Functional links provided to other land record-related activities.

2.1.2.1. Operable across different browsers - no change in information, navigation buttons, and functionality (6.25 points)

According to (https://gs.statcounter.com/browser-market-share/desktop/india), for October 2020, the shares of the top desktop browsers share in India were as follows: Chrome (86.8 per cent), Firefox (5.7 per cent), Edge (2.8 per cent), and Safari (2.1 per cent). Hence, in order to understand whether the websites are operable across browsers without loss of information, no change in navigation buttons and functionality checks should be conducted on three browsers, viz., Chrome, Firefox, and Edge. If there is any change in the information, navigation buttons, and their functionality on the website on a particular browser, then a 100 per cent penalty is levied, and no change earns the State/UT full points. Each of the three browsers is given equal weight for calculating the scores.

2.1.2.2. Website availability in two languages (6.25 points)

Generally, most of the States have their land record-related website in one local/State language. Some of the citizens, even from within the State, may not be proficient in the local/State language. Hence, it was assumed that the land records' websites are likely to be more accessible if they can be available in two languages, with the second language being English or Hindi. The States/UTs with websites in two languages were given full scores and zero if the websites used only one language.

2.1.2.3. RoR availability in two languages (6.25 points)

Most States have land records in local languages. Some citizens may not be capable of reading documents in the local or the State language. Hence, the RoR may be accessible if they are available in two languages, with the second language being English or Hindi. Thus, the States/UTs having RoRs in two languages were awarded full scores.

2.1.2.4. Functional links provided to other land record-related activities (6.25 points)

Three major activities related to land transactions and other services have been identified. The hyperlinks of these websites should be hosted on the land records website of the State/UT concerned so that it will be easy for the citizens to avail of these services. They are the links for registration, portals for online fee payments, and links to the revenue courts' portals. If a particular link is available, then full points were given, else zero. The three functional

links have been accorded equal weightage.

2.1.3. *Website Design and Navigation (25 Points)*

While technocratic norms and conventions exist for website design, these are subjective and dependent on the agency and purpose. By distilling such norms, the following four proxy indicators have been used with the caveat that these are somewhat subjective in nature:

- Consistency in the menus;

- Availability of information using the basic data—RoR, CM, CR;

- Display clarity; and

- Availability of the search button.

2.1.3.1. Consistency in menus (6.25 points)

Ensuring consistency in the menu is essential in any website design to enable the end-user to check the required information quickly and efficiently. If the menus in the land-related websites are consistent, that is, they follow some sort of logic that is easy to follow, then full points were awarded, else zero.

2.1.3.2. Information availability with basic data—RoR, CM, CR (6.25 points)

For this indicator, tests have been carried out to check whether the RoR, CM, and CR data can be accessed using the basic details like the plot number and name of the owner. If the data could be accessed with both the plot number and the name of the owner, then full points were awarded, else zero. If the details could be accessed using only one of the two basic details, that is, either the plot number or the name of the owner, then a penalty of 50 per cent is imposed. Equal weightage is given to the RoR, CM, and CR websites for finalising the State/UT score for this proxy.

2.1.3.3. Display clarity (6.25 points)

A cluttered display can confuse the users and prevent them from understanding the information. If excessive content or information that is not relevant to the purpose was crammed on the website page and did not appear relevant to the RoR, CM, or CR, then a 100 per cent penalty was imposed, or else full points were given. The assessment of this element is dependent on the perception of the person assigning the scores.

2.1.3.4. Availability of the search button (6.25 points)

The availability of a functional search button is crucial for any website as it helps users carry out a search according to their needs. Half the points were awarded for States/UTs that displayed the search option on the main page, and the other half were awarded when the search tab was found to be functioning efficiently.

2.1.4. *Help/Assistance (25 points)*

The following two proxy indicators have been designed to measure the Help/Assistance indicator, an assistance feature of accessibility:

- Availability of the help/Frequently Asked Questions (FAQs) tab and

- Customer care.

2.1.4.1. Availability of the Help/Frequently Asked Questions (FAQs) tab (12.5 points)

The help/FAQ tab is helpful for getting answers to the general problems faced by citizens in accessing the website. If the help/FAQ tab was available, half the points were awarded, else zero. The remaining half were awarded if the tab was found to be working.

2.1.4.2. Customer care (12.5 points)

This proxy indicator has six dimensions—availability of service, active status, dissemination of the customer care message in the local language, dissemination of the customer care message in two languages, customer care capability to answer basic website navigation queries, and customer care capability to answer questions related to a particular plot number (especially information on the RORs, CMs, and CRs). The six elements were accorded equal weightage, leading to a total of 12.5.

3. Computing the Accessibility Index of States/UTs

Websites of all the States/UTs related to land records (RoRs, CMs, and CRs) were tested using a range of browsers, devices, and bandwidths. The test checks were carried out online by the NCAER Land Policy Initiative team in the last week of December 2020 and the first week of January 2021. Four States and one UT, that is, Arunachal Pradesh, Meghalaya, Mizoram, Nagaland, and Ladakh, were yet to make land data public on the web. Hence, the Accessibility Index has been computed for 24 States and seven UTs.

3.1. Ease of Access

The websites of Bihar, Chhattisgarh, and Andhra Pradesh enable access to all the land records data within five seconds on a standard broadband connection, different network frequencies (2G, 3G, and 4G), and browsers of various mobile devices. Hence, they are the top scorers with regard to the 'ease of access' component. On the other end, Assam and Delhi do not have their CMs and CRs uploaded on their websites and hence scored zero. Kerala is the only State in India where the RoRs and CMs can only be viewed with payment of a user fee, and hence it scored zero for the component on 'accessibility of RoRs and CMs'. Sikkim, Jammu & Kashmir, and Chandigarh are also at the bottom with regard to the 'ease of access' component, as they have only the CRs uploaded in pdf format and are yet to launch websites for RoRs and CMs. Figure 1 presents the scores for 'ease of access' across the States/UTs of India (for scores on proxy indicators of ease of access of each State/UT, see Annex Table A1).

Figure 1: Scores of Ease of Access of all States/UTs
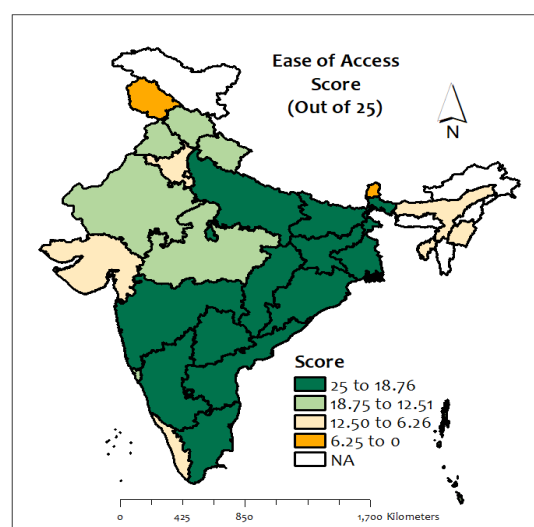
3.2. Comprehensive Information

Odisha registered high scores on the comprehensive information category of the Accessibility Index, as the State has a dual-language portal with functional links to other land records-related services. The websites of most States/UTs were operable across all browsers and devices. Apart from zero scores attributed to Sikkim, Jammu & Kashmir, and Chandigarh due to lack of websites for RoRs and CMs, the States/UTs of Andaman & Nicobar Islands, Assam, Dadar & Nagar Haveli, Daman & Diu, Puducherry, Chhattisgarh, Goa, Lakshadweep, Himachal Pradesh, Kerala, and Uttarakhand are at the bottom of the table with regard to this component. They scored low as the land portals of these States/UTs do not have functional links to the other land records-related activities and services like registration, online fee payment portals, and revenue courts portals. None of the States/UTs in the country has documents in more than one language. Figure 2 presents the scores of comprehensive information across the States/UTs of India (for the scores of proxy indicators of comprehensive
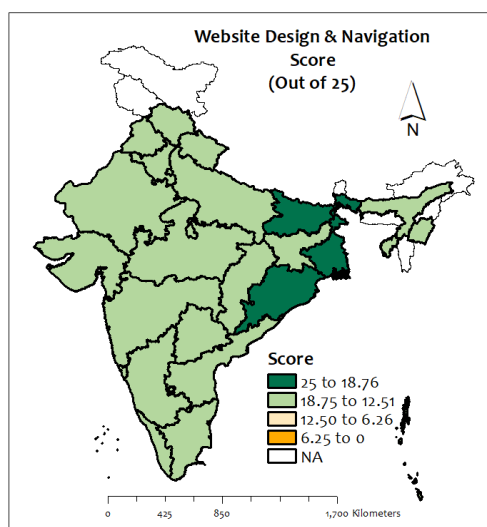
information of each State/UT, see Annex Table A2).

3.3. Website Design and Navigation

West Bengal scored the highest points on the indicators of website design and the navigation component. Out of four sub-components, most States/UTs scored the maximum for the indicators pertaining to menu-design consistency and no-clutter display. The availability of the search option and its functionality in the land portals of West Bengal fetched it the highest points. Apart from Sikkim, Jammu & Kashmir, and Chandigarh that do not have websites for RoRs and CMs, the States/UTs of Puducherry, Andaman & Nicobar Islands, Kerala, and Manipur have portals without the search option and also lack access to information details like the plot number and name of the landowner. Therefore, they recorded low scores on website design and the navigation component. Figure 3 presents the scores on website design and navigation across the States/UTs of India (for the scores of proxy indicators

Figure 3: Scores of Comprehensive Information of all States/UTs
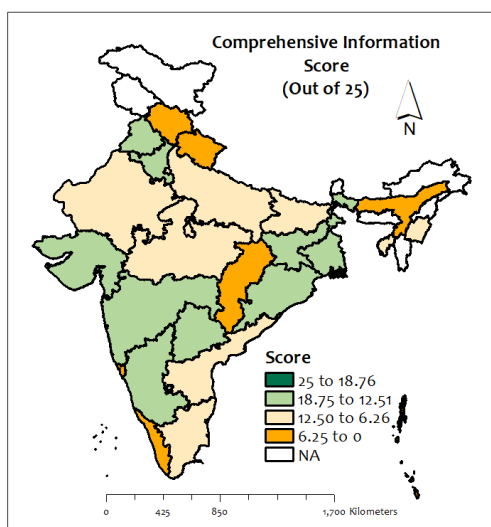
**Figure 2: Scores of Website Design and Navigation of all States/UTs**

of website design and navigation of each State/UT, see Annex Table A3).

Help/Assistance

Only six States/UTs, namely, Karnataka, Manipur, Odisha, Himachal Pradesh, Uttar Pradesh, and West Bengal, scored full high points on the indicator of 'Help/Assistance' (Figure 4). The land record portals of most of the States/UTs portals face challenges related to the help/assistance feature. Websites without help/FAQs and customer care functions can seriously constrain citizens from accessing the land records-related information pertaining to the scores of help/assistance across the States/UTs of India (for scores of proxy indicators of help/assistance of each State/UT, see Annex Table A4).

The all-India mean of the Accessibility Index of all the States/UTs for 2021, an average of all the States/UTs for which the index has been computed, is 51.08. Odisha, West Bengal, Karnataka, Bihar, and Uttar Pradesh are the top five States offering the best access to users via their websites. The bottom five States/UTs in this regard are Andaman & Nicobar Islands, Assam, Jammu & Kashmir, Sikkim, and Chandigarh. Figure 5 depicts the scores of the States on the Accessibility Index.

Figure 4: Scores of Help/Assistance of all States/UTs N-LRSI 2021 and the Accessibility Index 2021
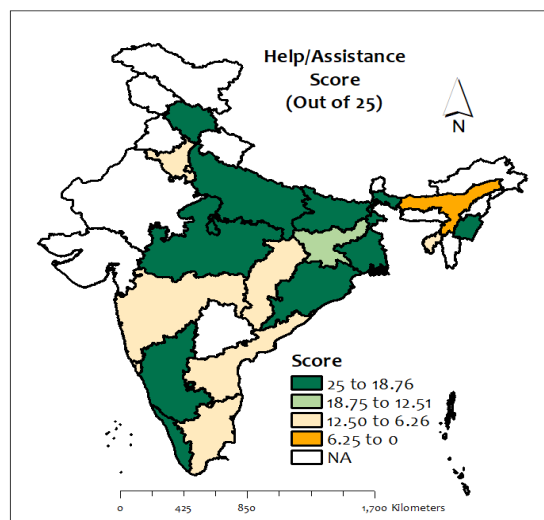
**Figure 5: Scores of Accessibility Index of all States/UTs**
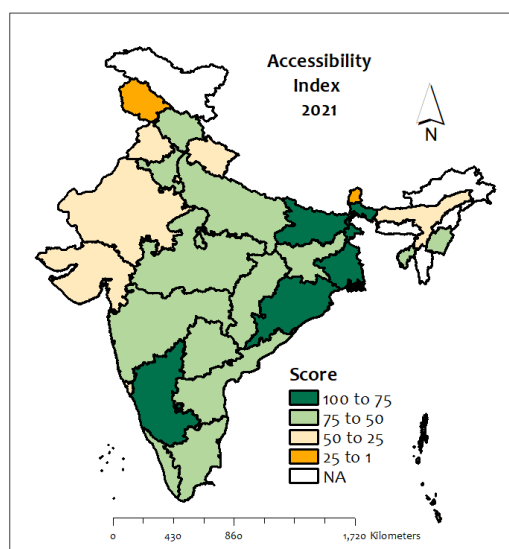
NCAER Land Records and Services Index (N-LRSI) was first launched in 2020 to assess the status of States/UTs on the supply-side aspects of the extent of digitisation (a score of 60 per cent) and the quality of land records (a score of 40 per cent). The

of records, and lead to improved land tenure security.

To measure whether digitisation and improved quality of land records go hand in hand with more accessible land portals and associated services,

Figure 6: Scores of NLRSI 2021 versus the Accessibility Index 2021
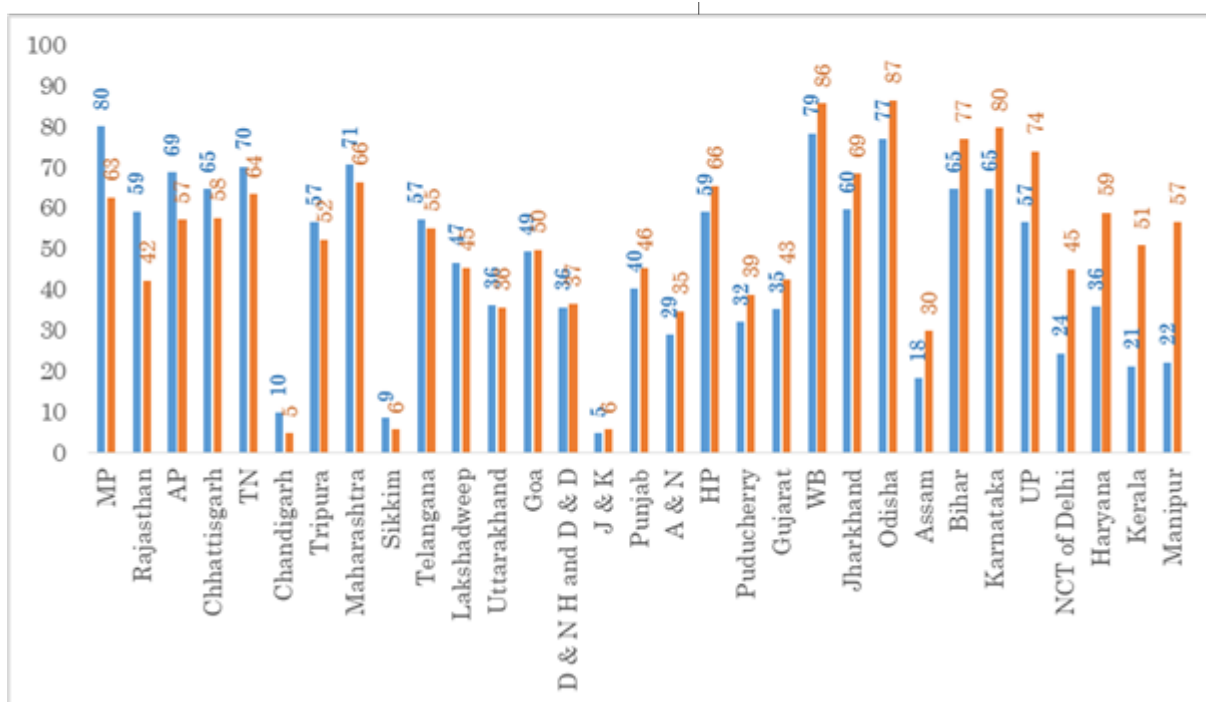
second edition of N-LRSI (2021) showcased the current status and progress made by the States/UTs on the supply-side aspects of the extent of digitisation and quality of land records since the launch of the first edition. Access to land records allows the landowners to inspect the documents and apply for corrections, if any discrepancies are observed. This would subsequently help improve the quality

4. Policy Implications

The Accessibility Index highlights the fact that despite the progress made by some of the States/UTs in overall digitisation and the quality of land records, they offer a relatively less commendable user experience of this digitisation.

the Spearman's correlation has been computed between N-LRSI 2021 and the Accessibility Index 2021. A strong positive correlation is observed between the N-LRSI 2021 scores and the Accessibility Index 2021 scores, with a correlation coefficient of 0.81. Figure 6 shows the comparative scores of N-LRSI 2021 (blue bars) and Accessibility Index 2021 (orange bars).

Therefore, mere digitisation is not enough to assure the provision of better services provision.

Very few States/UTs score marginally low on accessibility despite recording an impressive performance in N-LRSI 2021—these include Andhra Pradesh, Madhya Pradesh, Chhattisgarh, and Rajasthan. For these States, better performance in digitisation and the

quality of records has not translated into better services due to drawbacks in the website's design.

In contrast, several States/UTs have accessible websites. However, their record in terms of digitisation and the quality of records needs improvement. These include Manipur, Kerala, Haryana, and the NCT of Delhi.

The following policy prescriptions are worth pursuing:

a) *Addressing the accessibility barriers*: States that have a good record of digitisation and services can quickly ramp up the quality of their services and user experience by addressing the accessibility barriers. Even while the N-LRSI exercise was in underway, some States started making improvements in accessibility, showing that these are the areas for quick wins and may not even require huge investments. Medium-term improvements may require upgradation of hardware and/or software. The N-LRSI 2021 also showed that data inaccuracies dogged the performance of the system and would cause avoidable inconvenience for the user. Therefore, some of the States/UTs will need to cross-check that the data being entered is correct. A related corrective action is to ensure that the Government of India's DoLR portal data is consistent with the data on the State website.

b) *Following the CIGW guidelines*: States/UTs that are in the process of digitising their records and services have the opportunity to get their design right by following the GIGW guidelines strictly, right from the start. In the case of these States, choice of the right hardware and software, and careful data entry and cross-checks can potentially ensure transition to a system wherein users face minimum glitches in accessibility.

c) *Ease of access*: The national mean exceeds 16 (out of 25) and 11 States/UTs score more than 20 (out of 25) with regard to ease of access for their websites, indicating that other States can also reach a better score by emulating these better-performing States.

d) *Comprehensiveness of information*: The information available on the State portals fares poorly with a national mean of less than 10 (out of 25), and only 7 States with more than 15 (out of 25). This is an area that all the States/UTs will need to accord attention to. This will require a review of the data that is being made available and how it is being structured and organised on the websites. This may also require some investments in serving data more comprehensively but some of the issues relate to streamlining the design of the portal and links, which could possibly be addressed with modest investments in a short time frame.

e) *Website design and navigation*: Even with the partially

subjective indicators, States and UTs appear to record scores similar to one another (most clustered around 15 out of 25). It is crucial to attend to this issue, especially since the potential of mobile phone penetration in rural India is yet to be fully realised, and this segment is likely to face the maximum difficulties with regard to website design and navigation. The Union and State Governments may consider partnering with private sector manufacturers in the areas of both hardware and software to devise innovations that would help in the development of user-facing standards and designing of norms for different generations of phones. Different standards of service may also be devised for different user segments, intermediated with hybrid solutions like computer kiosks and *seva kendra*s doubling up as service providers. This will also necessitate strengthening the human/bot-based help facilities noted below.

f) *The help and customer care indicators*: These indicators yield a bipolar distribution with nine States/UTs scoring high (more than 20 out of 25), and most of the rest scoring below 12.5 (out of 25). This is an area in which the lagging will do well to improve their performance. At the very least, providing an FAQ page should not be difficult. Providing real-time phone-based help may entail costs, but offering at least the service of day-time in sourcing of the business vendor should not be a prohibitive task for most States. This is also a facility that will benefit many citizens in the rural areas and small towns, especially if their personal devices are simple or just basic smartphones.

g) *Government guidance*: Finally, the national flagship programmes of the Government of India may provide some useful guidelines in consonance with the GIGW. Further, apart from the promotion of digitisation, enhanced user experience and accessibility could be emphasised and incentivised.

5. Limitations of the Accessibility Index

The Accessibility Index 2021 is the first and only metric available to assess whether the land record portals designed by the States/UTs follow the GIGW 2.0 standards for ensuring that the data hosted on those portals are accessible to all the citizens. While designing the Index, a large number of indicators of accessibility are taken into consideration. However, the current Index does not offer the following:

- Features in websites offering benefits to users with disabilities relating to vision and

- Options of receiving timely feedback/queries.

The current Index has been computed based only on the supply-side of the land record portals. The Index could become more robust when it would be possible to gauge the supply and demand side of the land records and services accessibility.

Hence, there is a need to incorporate findings from the survey of the end-users' actual experiences in terms of accessing land records and associated services.

6. Accessible Land Records and Privacy Concerns

The DILRMP signifies a great leap forward towards achieving transparency and efficiency in land administration. Under this programme, most of the States/UTs have made their land records available on websites free of cost (see Table 1). In general, land records (RoRs, CMs, and CRs) contain details of the owner, location, property type, and the assessed property value. Providing an individual's personal information on the Internet without knowing who is accessing it and to what end can pose personal hazards. The land records data available can be used or merged with other public/private data to generate a new data set, which can be employed for other uses beyond the intended purpose. For example, real estate agents/agencies and property dealers can utilise the information provided in the land records for their businesses but without the consent of owners. With no personal data protection laws existing in India right now, the Government of India and the States/UTs need to address issues of data privacy and to implement regulations for ensuring that all data is being accessed for lawful purposes and that such access does not pose hazards to stakeholders. At the very least, efforts need to be made to prevent misuse of the accessed data. New and emerging concepts in information technologies like *Self-Sovereign Identity* (SSI), wherein individuals have control of their digital identity, can address privacy concerns in accessing land records. Obtaining the consent of individuals may be made essential before using their credentials. These issues will need to be discussed and appropriate transitional arrangements devised in the future, for striking a balance between privacy and security, and providing easy access to data for the efficient management of land records.

ANNEXURES

Table A1: Scores on Ease of Access and Its Proxy Indicators

S. No.	State/UT	Website loading time	No. of attempts to access the content	Content loading time	Accessibility on different mobile band-widths	Accessibility on Mobile phone	Ease of Access Score (25)
1.	Bihar	5.00	5.00	5.00	3.33	5.00	23.33
2.	Chhattisgarh	5.00	5.00	5.00	3.33	5.00	23.33
3.	Andhra Pradesh	5.00	5.00	5.00	3.33	5.00	23.33
4.	Telangana	5.00	5.00	4.67	3.33	5.00	23.00
5.	Odisha	5.00	5.00	4.67	3.33	5.00	23.00
6.	Uttar Pradesh	5.00	5.00	4.67	3.33	5.00	23.00
7.	Tamil Nadu	4.58	5.00	5.00	3.33	5.00	22.92
8.	Maharashtra	4.72	5.00	4.67	3.33	5.00	22.72
9.	Karnataka	4.58	5.00	4.67	3.33	5.00	22.58
10.	West Bengal	5.00	5.00	4.00	3.33	5.00	22.33
11.	Jharkhand	4.44	3.33	5.00	3.33	5.00	21.11
12.	Himachal Pradesh	3.75	3.67	3.00	3.33	5.00	18.75
13.	Lakshadweep	3.33	3.33	3.33	3.33	5.00	18.33
14.	Rajasthan	5.00	4.00	1.67	1.67	5.00	17.33
15.	Puducherry	3.33	3.33	3.33	3.33	3.33	16.67
16.	Goa	3.33	3.33	3.11	3.33	3.33	16.44
17.	Punjab	3.33	3.33	3.00	3.33	3.33	16.33
18.	Madhya Pradesh	5.00	3.56	1.00	1.67	5.00	16.22
19.	Uttarakhand	3.33	1.67	3.33	3.33	3.33	15.00
20.	Andaman & Nicobar Islands	3.33	1.67	3.33	3.33	3.33	15.00
21.	Dadra & Nagar Haveli and Daman & Diu	3.33	3.33	1.67	1.67	3.33	13.33
22.	Gujarat	3.33	3.00	1.00	1.67	3.33	12.33
23.	Haryana	2.50	2.67	2.00	1.67	3.33	12.17
24.	Tripura	3.33	2.67	0.67	1.67	3.33	11.67
25.	Manipur	1.67	1.67	1.67	3.33	1.67	10.00
26.	Delhi	1.67	1.67	1.33	3.33	1.67	9.67
27.	Kerala	3.33	3.33	0.33	0.00	1.67	8.67
28.	Assam	1.25	1.67	0.33	1.67	1.67	6.58
29.	Sikkim	1.67	1.67	1.00	0.00	1.67	6.00
30.	Jammu & Kashmir	1.67	1.33	1.33	0.00	1.67	6.00
31.	Chandigarh	1.67	0.00	1.67	0.00	1.67	5.00

Table A2: Scores on Comprehensive Information and Its Proxy Indicators

S. No.	State/UT	Operable across different browsers	Website availability in two languages	Documents availability in two languages	Functional links provided	Comprehensive Information Score
1.	Odisha	6.25	6.25	0.00	6.25	18.75
2.	Karnataka	6.25	6.25	0.00	4.17	16.67
3.	Telangana	6.25	6.25	0.00	4.17	16.67
4.	Haryana	6.25	6.25	0.00	4.17	16.67
5.	Jharkhand	6.25	6.25	0.00	4.17	16.67
6.	West Bengal	6.25	6.25	0.00	4.17	16.67
7.	Maharashtra	6.25	6.25	0.00	4.17	16.67
8.	Punjab	6.25	6.25	0.00	2.08	14.58
9.	Gujarat	6.25	6.25	0.00	2.08	14.58
10.	Tripura	6.25	0.00	0.00	6.25	12.50
11.	Bihar	6.25	0.00	0.00	6.25	12.50
12.	Tamil Nadu	6.25	6.25	0.00	0.00	12.50
13.	Uttar Pradesh	6.25	0.00	0.00	4.17	10.42
14.	Manipur	6.25	0.00	0.00	2.08	8.33
15.	Rajasthan	6.25	0.00	0.00	2.08	8.33
16.	Madhya Pradesh	6.25	0.00	0.00	2.08	8.33
17.	Delhi	6.25	0.00	0.00	2.08	8.33
18.	Andhra Pradesh	6.25	0.00	0.00	2.08	8.33
19.	Assam	6.25	0.00	0.00	0.00	6.25
20.	Uttarakhand	6.25	0.00	0.00	0.00	6.25
21.	Kerala	6.25	0.00	0.00	0.00	6.25
22.	Andaman & Nicobar Islands	6.25	0.00	0.00	0.00	6.25
23.	Lakshadweep	6.25	0.00	0.00	0.00	6.25
24.	Dadra & Nagar Haveli and Daman & Diu	6.25	0.00	0.00	0.00	6.25
25.	Chhattisgarh	6.25	0.00	0.00	0.00	6.25
26.	Goa	6.25	0.00	0.00	0.00	6.25
27.	Himachal Pradesh	6.25	0.00	0.00	0.00	6.25
28..	Puducherry	6.25	0.00	0.00	0.00	6.25
29.	Chandigarh	0.00	0.00	0.00	0.00	0.00
30.	Sikkim	0.00	0.00	0.00	0.00	0.00
31.	Ladakh	0.00	0.00	0.00	0.00	0.00
32.	Jammu & Kashmir	0.00	0.00	0.00	0.00	0.00

Table A3: Scores on Website Design and Navigation and Its Proxy Indicators

S. No.	State/UT	Consistency in menus	Availability of information with basic data	Display clarity	Availability of search button	Website Design & Navigation
1.	West Bengal	6.25	3.13	6.25	6.25	21.88
2.	Lakshadweep	6.25	2.08	6.25	6.25	20.83
3.	Odisha	6.25	4.17	6.25	3.13	19.79
4.	Bihar	6.25	3.13	6.25	3.13	18.75
5.	Haryana	6.25	2.08	6.25	3.13	17.71
6.	Rajasthan	6.25	4.17	6.25	0.00	16.67
7.	Karnataka	6.25	3.13	6.25	0.00	15.63
8.	Tripura	6.25	3.13	6.25	0.00	15.63
9	Telangana	6.25	3.13	6.25	0.00	15.63
10.	Madhya Pradesh	6.25	3.13	6.25	0.00	15.63
11.	Gujarat	6.25	3.13	6.25	0.00	15.63
12.	Chhattisgarh	6.25	3.13	6.25	0.00	15.63
13.	Himachal Pradesh	6.25	3.13	6.25	0.00	15.63
14.	Tamil Nadu	6.25	3.13	6.25	0.00	15.63
15.	Uttar Pradesh	6.25	3.13	6.25	0.00	15.63
16.	Andhra Pradesh	6.25	3.13	6.25	0.00	15.63
17.	Assam	6.25	2.08	6.25	0.00	14.58
18.	Punjab	6.25	2.08	6.25	0.00	14.58
19.	Uttarakhand	6.25	2.08	6.25	0.00	14.58
20.	Dadra & Nagar Haveli and Daman & Diu	6.25	2.08	6.25	0.00	14.58
21.	Delhi	6.25	2.08	6.25	0.00	14.58
22.	Goa	6.25	2.08	6.25	0.00	14.58
23.	Jharkhand	6.25	2.08	6.25	0.00	14.58
24.	Maharashtra	6.25	2.08	6.25	0.00	14.58
25.	Manipur	6.25	1.04	6.25	0.00	13.54
26.	Kerala	6.25	1.04	6.25	0.00	13.54
27.	Andaman & Nicobar Islands	6.25	1.04	6.25	0.00	13.54
28.	Puducherry	6.25	1.04	6.25	0.00	13.54
29.	Sikkim	0.00	0.00	0.00	0.00	0.00
30.	Chandigarh	0.00	0.00	0.00	0.00	0.00
31.	Jammu & Kashmir	0.00	0.00	0.00	0.00	0.00

Table A4: Scores on Help/Assistance and Its Proxy Indicators

S. No.	State/UT	Help/FAQ	Customer Care	Help/Assistance
1.	Karnataka	12.5	12.50	25.00
2.	Manipur	12.5	12.50	25.00
3.	Odisha	12.5	12.50	25.00
4.	Himachal Pradesh	12.5	12.50	25.00
5.	Uttar Pradesh	12.5	12.50	25.00
6.	West Bengal	12.5	12.50	25.00
7.	Bihar	12.5	10.00	22.50
8.	Kerala	12.5	10.00	22.50
9.	Madhya Pradesh	12.5	10.00	22.50
10.	Jharkhand	6.25	10.00	16.25
11.	Tripura	12.5	0.00	12.50
12.	Chhattisgarh	12.5	0.00	12.50
13.	Delhi	0	12.50	12.50
14.	Goa	0	12.50	12.50
15.	Haryana	12.5	0.00	12.50
16.	Tamil Nadu	12.5	0.00	12.50
17.	Maharashtra	0	12.50	12.50
18.	Andhra Pradesh	0	10.00	10.00
19.	Assam	0	2.50	2.50
20.	Dadra & Nagar Haveli and Daman & Diu	0	2.50	2.50
21.	Puducherry	0	2.50	2.50
22.	Chandigarh	0	0.00	0.00
23.	Punjab	0	0.00	0.00
24.	Rajasthan	0	0.00	0.00
25.	Sikkim	0	0.00	0.00
26.	Uttarakhand	0	0.00	0.00
27.	Telangana	0	0.00	0.00
28.	Andaman & Nicobar Islands	0	0.00	0.00
29.	Gujarat	0	0.00	0.00
30.	Lakshadweep	0	0.00	0.00
31.	Jammu & Kashmir	0	0.00	0.00

Further Readings

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About NCAER's Land Policy Initiative

NCAER launched the NCAER Land Policy Initiative (N-LPI) in April 2019 with the generous support of the Omidyar Network to build on the institution's prior analytical work on land, its 60-plus years of experience with data collection, and its long-standing relationship of trust with governments. The objectives of the N-LPI are to: (1) raise official and citizen awareness of the distortions in India's land markets and

their cost to the economy; (2) produce and curate evidence and land data, and suggest solutions and State rankings that can nudge the States/UTs through competitive federalism to improve their land administration, records, and services; (3) where requested, pilot such solutions with States and evaluate them; and (4) help build a more extensive research community of analysts and experts on land issues in India. The Land Policy Initiative has been set up with two broad objectives, viz., the creation of: (a) NCAER's Land Records and Services Index (N-LRSI), and (b) NCAER's Land Data Portal. At the same time, N-LRSI will create an Index to capture the extent of digitisation of land records and the quality of land records in the Indian States and UTs. The land data portal will be a data warehouse for all publicly available land data in India and N-LRSI data.

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NATIONAL COUNCIL OF APPLIED ECONOMIC RESEARCH

NCAER India Centre, 11 Indraprastha Estate, New Delhi 110 002, INDIA.
Phone: +91-11-2345 2698; 6120 2698 Email: info@ncaer.org
www.ncaer.org

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