Using Administrative Data for Monitoring and Improving Land Policy and Governance in India

Pranab Ranjan Choudhury **Manoj Kumar Behera**
Center for Land Governance, NRMC, Bhubaneswar-751003, Odisha, India
Mob: (+91)-9437021261 **Mob: (+91)-9658179316**
Email: pranabrc@nrmc.co **Email: manojbehera1991@gmail.com**

Abstract

Demands for production and dissemination of reliable data is growing with increasing demand from public policies to monitor, compare and improve global and national developmental status and targets. Implementation of intentionally agreed commitments like Millennium Development Goals (MDGs), Sustainable development Goals (SDGs) are influencing data production and availability, and the development of national statistical capacities. They also trigger challenges and opportunities in production of internationally comparable data to induce fair comparability among nations. Being a signatory to major international treaties, India has considerably improved data production, accessibility and availability over the years to ensure proper alignment of national level statistics and induce international comparison. However, very little efforts have been made to assess India's progress around data production and dissemination around growingly important land governance. This assessment attempts to identify key opportunities and challenges at the country level to improve data availability, access, timeliness and quality.

India has made many progressive reforms around land laws and institutions to make land governance more inclusive and equitable; however its assessment with respect to global best practices through World Bank's Land Governance Assessment Framework (LGAF) indicate the need of improvements around different land dimensions. Movement towards good land governance outcomes is incumbent upon robust and regular monitoring mechanism of land indicators across spatial (viz. administrative boundaries, land being a state subject in India) and temporal scales.

India has traditions of collecting, maintaining and reporting land information through nation-wide surveys, census, administrative and judicial reports/ databases. Its flagship program Digital India Land Record Modernization Program (DILRMP), has been supporting universal digitization of spatial and textual land records by the states. Together, these administrative and survey-derived datasets provide seamless opportunity for routine generation of data on key land indicators at low cost on a regular basis. Land is a state subject in India. Monitoring and reporting land-indicators at state levels would help in systematically discovering and identifying good practice that can then be documented and disseminated across states, manage change, and gradually move towards a more performance-based approach to improving land governance in India. However, there have been lack of institutionalized attempts, so far, to report land-indicators at national scale.

We have tried to assess the state of data in India, particularly to track and report two critical land governance indicators viz. women land rights and forest rights, critical to ensure equity and sustainability in terms of public policy. With UN's SDG, defining similar indicators, we also attempt aligning them around SDG indicators. Status of these two parameters were analyzed using nation-wide datasets collecting whole population data, through legitimate institutions following robust processes and reporting them open access.

Census (human population) data and Forest Survey of India (FSI) data were used to assess village-wise forest areas eligible for recognition of rights under India's historic Forest Rights Act, 2005. Using the FSI data and meta-analysis of census data, we calculated the estimated population (150 million including 90 million tribal) living in villages that have forest land within administrative revenue boundaries, potential area (40 million ha) that can be recognized under FRA and number of villages (0.17 million) that are eligible to initiate the claim. These data were made available across administrative boundaries of state, district and village, providing opportunities for relevant Government Ministries at Central and State level and civil society to expedite the forest rights recognition under India's largest land reform process.

In order to assess women's land rights (WLR) in India in the context of the SDGs, after examining the existing data sets, we used Agricultural Census data, conducted by Government of India every fifth year following the guidelines of World Census on Agriculture (WCA). Using Agricultural census data, we have developed atlas of women land rights (based on operational holdings) in India with state and district wise granularity with further disaggregation across ethnicity (caste) and other socio-economic parameters. The study also attempted to analyze the link between the inter-regional and temporal variability of WLR and relevant policies and legal-institutional frameworks among the states to see if the correlations can better inform public policy and also induce healthy competition among states to appreciate and follow best practices. This paper presents the process, methodology and results of the data-analysis for these two land indicators while delving into the scope and challenges of dealing with existing and upcoming big datasets in India to report the land governance indicators and the potential policy spinoffs.

Key words: Big Data, Forest Rights, India, SDGs, Women Land Rights

1. Background

1.1 Data for Policy and Good Governance

Production, availability and accessibility of reliable data and statistics are of fundamental importance in tracking progress, taking evidence-based decisions for effective policy making and implementation, and also to observe transparency and strengthen accountability. The demands for data is increasingly focused towards monitoring of global and national developmental status and targets and enable good governance. Implementation of intentionally agreed commitments like Sustainable development Goals (SDGs) largely influence data production and availability, and the development of national statistical capacities (OECD, 2015). At the same time, it also creates challenges in production of internationally comparable data to induce fair comparability among nations. The Independent Experts Advisory Group on the Data Revolution (IEAG) has acknowledged the crucial role of data for decision-making and monitoring. Data has a potentially revolutionary effect on economic analysis and policy making (Lenard and Rubin, 2013). United Nations Statistics Division (UNSTAT), the nodal agency for monitoring the SDGs has also highlighted the key role of reliable data sets with adequate disaggregation and granularity in measuring incentivize progress around SDG targets. Being a signatory to major international treaties, India has considerably improved data production, accessibility and availability over the years to ensure proper alignment of national level statistics and induce international comparison.

1.2 Land Rights and Development

Secure and equitable rights over natural resources is globally seen as a precursor to the achievements of numerous global development priorities including poverty elimination, food security, rural development, gender equality and women empowerment etc. FAO's Voluntary Guidelines on the Responsible Governance of Tenure (VGGT) of Land, Fisheries and Forests in the Context of National Food Security (the "Guidelines", FAO, 2012) has also outlined the importance of monitoring in achieving equity over natural resources. Secured land tenure is essential for effective land use, investment, job creation, agricultural productivity, inclusive urbanization, cultural identity, biodiversity conservation and climate resilience and disaster preparedness.

In spite of a wide range of international declarations and covenants on gender equity and women empowerment, the growing disparity in land ownership is a cause of concern. The Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) reflects women's rights to land in ending poverty, achieving dignity for all and reducing gender based discrimination and violence. The inclusion of gender equitable and secure land rights of vulnerable groups in the recently endorsed UN's Sustainable Development Goals (SDGs) is a reiteration of its increasing importance and urgency in the global context. In the context of India, equitable rights in land resources are of paramount importance as 75 percent of the female workforce depends on agriculture for food and livelihoods. The Indian Constitution also provides equal rights to both men and women. Secure land rights of women have demonstrated enhanced agricultural productivity and building resilience among the small and marginal farmers, who constitute 75 percent of the farming community. FAO has reported that closing the gender gap in agriculture with women's access and ownership of land and productive assets, could raise total agricultural output in developing countries by 2.5 – 4 percent, thereby reducing the number of hungry people in the world by 12 – 17 % (FAO, 2011). In the absence of secure land titles, women are also unable to access markets, technologies, inputs, insurance and institutional credit (Rao, 2011 and Neetha, 2010).

The discrimination in terms of land rights distribution is also huge across caste and scheduled tribes are the most sufferer ones. Over the last few years, both central and state governments have made many progressive reforms to realize the goal of secure and equitable land tenure for all. Among them, the 2005 amendment to Hindu Succession Act, 1956 and implementation of Forest Rights Act (FRA), 2006 are considered to have made crucial contribution to the cause of secure and equitable land tenure rights.

1.3 Big Data in Land Governance of India

India has made many progressive reforms around land laws and institutions to make land governance more inclusive and equitable; however its assessment with respect to global best practices through World Bank's Land Governance Assessment Framework (LGAF) indicate the need of improvements around different land dimensions. Movement towards good land governance outcomes is incumbent upon robust and regular monitoring mechanism of land indicators across spatial (viz. administrative boundaries, land being a state subject in India) and temporal scales.

India has traditions of collecting, maintaining and reporting land information through nation-wide surveys, census, administrative and judicial reports/ databases. Flagship program Digital India Land Record Modernization Program (DILRMP)[1], has been promoting digitization all spatial and textual land records by supporting the states. They provide seamless opportunity for routine generation of data on key land indicators based on administrative data that is already available in the system or that can be generated at low cost to allow monitoring of progress on land governance on a regular basis.

Monitoring and reporting land-indicartors is expected to provide a basis to systematically discover and identify good practices that can then be documented and disseminated across states. This would improve change management, and help gradually moving towards a more evidence and performance-based approach to improving land governance in India. Periodic monitoring is also

[1] **Digital India Land Record Modernization Program** (DILRMP, earlier NLRMP), is a centrally-sponsored government scheme to promote digitization of land records. Incomplete universalization of land records digitization; lack of existing provision for recording gender parameter, even with intent[1] and limitations in purposive data retrieval prevents, the computerized land records available through DILRMP, to be used for these indicators. In April, 2015, Department of Land Resources advised the states to introduce gender field for land owners in their property records. Considerable time and resources required to update and change the records and make them easily accessible for periodic monitoring.

imperative in the context of tracking global targets and goals viz. SDGs. However, there have been lack of attempts to report land-indicators at national scale. The framers of the SDGs expect that investments in improved data collection and monitoring at country level will produce data that provide incentives for governments to improve land governance performance and also greater readiness to engage with multiple stakeholders in data analysis and in achieving better understanding of the strengths and weaknesses of existing land governance policies and practices (UNSTAT, 2016).

Many Indian states, have reformed their land laws and institutions to prohibit gender based discriminations in access, control and management of land. The implementation of the Forest Rights Act (FRA), 2006 was aimed to redress historical injustices committed to the tribal communities by recognising their rights over forest lands, by prescribing eligibilities for conferring community and individual forest rights. The impacts of legal and institutional transformations, directed towards improving the status of WLR and Forest rights in India, are required to be measured across political geographies for providing a feedback loop to policy and institutions. However, in the absence of any monitoring mechanism, the changes are largely underreported or unreported. It not only restricts technological penetration and use in collecting and collating data but also affects planning and implementation process. This implicates the compelling need to have a monitoring system to track changes in WLR and Forest Rights. Monitoring and reporting WLR and Forest Rights status is expected to induce comparative appreciation and hence implementation of positive changes by the states. Regular measuring through use of administrative and survey data about their progress will inform governments and non-state actors about the impacts of such legislations on societal progress. In this direction, Centre for Land Governance, NRMC made an attempt to track and report two critical land indicators related to women land rights and forest rights.

2. Objective of our studies

These two studies aimed to make a preliminary assessment of the status of two land rights indicators, critical for equity, cultural-identity and sustainability in in the context of national and global public policy and priorities. The study on women's land rights was carried out to assess the status of women's land rights (target 5a) in India in the context of Sustainable Development Goals (SDGs) and to analyse different data sets for effective and periodic monitoring of women's land rights in India to realize the target of gender equitable land rights by 2030. Under Target 5a of SDGs, women's land rights indicator include 1(a) Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex; and 1 (b) share of women among owners or rights-bearers of agricultural land, type of tenure. The study on FRA has estimated the potential area over which CFR rights can be recognised in India. This maiden estimation was expected to offer a baseline for planning and effective implementation of CFR rights recognition under the FRA, and allows policy makers and forest dependent communities to assess the extent to which the law can be implemented.

3. Methodology

3.1 Data sources

These two indicators were tracked using nation-wide datasets collecting whole population data, through legitimate institutions following robust processes and reporting them open access. UNSTAT prescribes the data sources as LSMS-ISA and DHS surveys and National Household Income and Expenditure surveys. With regards to women's land rights indicator (Indicator 5.a.1 a & b[2]), FAO's Gender and Land Rights Database (GRLD) is already disseminating some of these available data. While this SDG indicator is considered superior (UNSTAT, 2016) to the "share of female agricultural holders" available through agricultural census data as it provides intra-holding/household information and can be made available in a shorter time span, this indicator exists or can be derived only for 21 countries. For India, GRLD, uses Agricultural Census information on land holdings, as LSMS was executed only once in 1997-98 and DHS done as NFHS doesn't report land data. Besides Agricultural Census, India Human Development Survey (IHDS) and National Family Health Survey (NFHS) were found to have desired potential to augment periodic and effective monitoring of land rights indicators. Moreover, successful implementation of DILRMP across the country will made crucial contribution in land records management and monitoring. It was also found that other data sources like Population Census, Socio-Economic Caste Census and micro-studies can have a complemental role in monitoring of land rights indicator (Table 1).

After examining all the potential data sets relevant for monitoring women's land rights, we took an attempt to use Agricultural Census data for benchmarking the status of women's land rights (WLR) in India. Agricultural census which is carried by 135 FAO member countries following guidelines of World Programme for the Census of Agriculture (WCA), provides options of easy access to gender-disaggregated data on women's landholdings at different administrative levels, from tehsil to country, along with options for disaggregation across land size, ethnicity and land relations (namely tenancy), offers the potential of proxy administrative datasets for gender-based land rights monitoring. Using this data set, we have developed atlas of women land rights (based on operational holdings) in India with state and district wise granularity with further disaggregation across ethnicity (caste) and other socio-economic parameters. The only limitation is that it gives information on management rights instead of ownership rights. However, agricultural holders[3] and landowners[4] are often used interchangeably in the context of measuring women's land rights (FAO, 2015a).

CGIAR research program on Policy, Information and Marketing (PIM)[5], sees a great potential overlap between management/holding rights and ownership` where property rights are well defined. WCA-2020 has advised countries to record

[2] **(a)** Proportion of total *agricultural population* with ownership or secure rights over agricultural land, by sex; and **b)** Share of women among owners or rights-bearers of *agricultural land*, type of tenure

[3] The operational holders of the land holding, who takes land use decisions, but may not own the land

[4] The legal owner of the land

[5] http://pim.cgiar.org/2015/11/20/how-sex-disaggregated-land-statistics-can-help-monitor-progress-of-the-new-sustainable-development-goals/

information on ownership rights along with management rights through the use of modern technologies. Similarly in order to estimate potential for recognition of community forest resource rights under India's Forest Rights Act, Census, 2001 (Population) data and India State of Forest (FSI) data were used to assess village-wise forest areas eligible for recognition of rights under FRA. The data on CFR rights recognition progress was obtained from official reports from the Ministry of Tribal Affairs (MoTA), Government of India.

Table 1: Indicator wise data sources with their characteristics

Measuring Indicators	**Potential data sources identified and analysed**	**Data characteristics**					
		Frequency of collection	**Collecting Agency**	**Unit of Enumeration**	**Disaggregation**	**Accessibility**	**Uses at international level**
Incidence of agricultural land ownership among women	Agricultural Census	5 years	Agricultural Census Division, Ministry of Agriculture, GoI	Household	Gender, caste, farm size etc.	Open	FAO (GLRD[6])
	IHDS	2 rounds conducted (2005-06 & 2011-12)	National Council of Applied Economic Research, University of Maryland	Individual	Gender, age, caste, mode of acquisition	Open	Foreign Universities & Researchers
	NFHS	4 rounds conducted since 1992-1993	IIPS & Ministry of Health and Family Welfare (MOHFW), Government of India		Gender, Age, spatial	Open (report available in pdf format, raw data is not published)	World Bank, UNICEF, UNFPA
Potential for recognition of Community Forest Resources Rights under FRA, 2006	India Sate of Forest Report, 1999	2 years	Forest Survey of India		Administrative	Open	RRI
	Status report of FRA	3 months	Ministry of Tribal Affairs		Administrative	Open	

[6] http://www.fao.org/gender-landrights-database/en/

3.1 Indicators

The WLR indicators developed out of this data almost align with those reported by micro-studies and India Human Development Survey (IHDS) at aggregate country level, with limited variations for some states. The study also attempted to analyze the link between the inter-regional and temporal variability of women's land rights and relevant policies and legal-institutional frameworks among the states to see if there are correlations for informed policy-feedback and to induce healthy competition among states to appreciate and follow best practices.

3.2 Methodology of Data extraction, tabulation and QGIS mapping

The data available in different formats were converted to excel format for tabulation, re-tabulation, cross-tabulation and analysed to generate indicator-wise state and district tables. Based on these indicators, thematic maps (with state and districts as units) by different indicators were prepared using QGIS, a free, open source Geographic Information System[7] for better visualization and appreciation of women's land rights. The value of indicators arrived from the analysis were compared with primary data collected and reported by published research (research papers, theses and past studies) on women's land rights based on micro-studies to compare women's land rights status with that based on administrative macro data.

Similar method was followed for estimating the CFR potential from the India State Forest Report, 1999 and Census, 2001 data.

4. Results

4.1 The state of data for land rights (within SDGs) monitoring in India

The implementation of SDGs urgently demands for a comprehensive assessment of existing statistical capacity in the country. This will help us to identify key opportunities and challenges at the country level to improve data availability, access, timeliness and quality. While comparing with the global SDGs monitoring document, we found that India partially fulfils the expectations related to production of reliable data on land rights. The DILRMP will take considerable time for modernizing land records pan India. The household surveys like IHDS, NFHS though produce desired information on land rights, are not able to address emerging needs of disaggregated data and information on all the desired parameters. They also presents only sample survey, which may not get acceptance by concerned government officials. In the absence of a common and standard land tenure module, it is very difficult to cross check the data sets around certain indicators. The NFHS, which incidentally reported women's land ownership figure in the fourth round of survey reports information on percentage of women owning land and/or house or with someone. Except spatial (viz. Rural/Urban), there is no disaggregation around age-group, ethnicity etc in NFHS. On the other hand, Agricultural census which meets the data disaggregation needs produce information on operational holdings and not ownership holdings. Table 2 and Table 3 further explain the state of available data sources in India.

The above mentioned datasets have their inherent strengths and weaknesses. However, from utility perspective, their implications on generation of research information, policy and practice may also be different. While robust household surveys suggested by SDG, are expected to influence policy and contribute to research, from practice perspective in India, such data can be contested by state and district land administrations, who may find DILRLP and Agricultural Census data more acceptable to consider reforms.

4.2 Benchmarking women's land rights in India

Our analysis of Agricultural census data found that women in India operate less number of land holdings, lesser area and smaller size of holdings in comparison to men. They operate 12.8 percent of total operational holdings that constitutes 10.34 percent of the total area of holdings. The average size of women's land holding is 0.93 ha, in comparison to 1.18 ha for male and 1.15 ha for all. The regional disparity with regards to women's land rights was evident with the states in the southern region showing comparatively more number and area of land holdings operated by women while the situation in Northern and Eastern region states are demonstrating a poorer picture. In the last decade (2001-11), number (36.12 percentage) and area (23.45 percentage) of women's holdings have increased, at a pace, higher than their population growth. States like Sikkim, Rajasthan, Bihar, Madhya Pradesh and Daman & Diu have shown higher increased in women's land holdings, while states/UTs like Chandigarh, Delhi, Jammu & Kashmir, Puducherry and Kerala report a negative trend in the percentage change of women's land holdings.

When compared with micro studies (12 studies in 9 states), carried out at district and block levels by researchers and civil society, we found an absolute difference of only 1 percent which could be because of differences in sampling method and sample size (Fig 1). However, this does not portray a clear picture on the percentage of woman out of total adult woman population either owning or operating land rights. This was obtained by dividing the number of female cultivators to total female adult population (from Population census) and comparing the result with that of IHDS data, which report incidence of land ownership among women.

It was found that there is an absolute difference of 4 percent (Fig 2) equivalent to a difference of 5% in percentage terms. This could be because of differences in sample size and data collection approach. This is in line with the observations made by Agrawal (1994), who apprehended it to be maximum 2 percent. Whether, this 2 percent increase in women's land ownership status within a period of 18 years, can be attributed to the policy dividend of implementation of Hindu Succession (Amendment) Act, 2005 and state led land reforms during the last decade, need further analysis.

[7] http://www.qgis.org; was earlier known as Quantum GIS.

Table 2: Global expectation on data sources and collection process vis-à-vis available data in India

Data sources	Global expectation	Potential data sources available in India	Key observations
Administrative records reported by national land institutions	Should be compared with household surveys (for informal documents)	DILRMP	Pan India implementation of DILRMP will take some more time. Possible to monitor in states where digitization of land records has been completed.
Census and multi-topic household surveys conducted by National Statistical Agencies.	Should provide information for residential and non-residential land, on (i) the share of individuals with secure tenure rights[8]; and (ii) the share of individuals who perceive their rights to be secure[9]	Agricultural Census, IHDS & NFHS (Household Survey)	Agricultural census provides information on agricultural lands. IHDS and NFHS report information on residential land. However, there is lack of harmonized data collection. Both have their own strengths and limitations. IHDS is carried out in rural areas. Various definitions or concepts (viz. secure tenure) need to be reviewed and standardised for enhancing data quality and utility.
Additional Sources (Identified by UNSTAT)			
World Bank's "Doing Business" data	Option to include the number of individuals with registered land documents will be explored.		Carried out in cities. Collection of land tenure information is subjected to DILRMP implementation
World Bank's multi-purpose household surveys in all IDA countries	A standard land tenure module will be included in this effort.		World Bank's Living Standard Measurement Survey (LSMS) was executed only once in 1997-98.
Data sets developed by civil society, such as ILC, WRI, RRI and the private sector	Their contribution to measurement of land rights monitoring will be assessed.		Civil society and Private sector provide both micro and macro level datasets including qualitative information related to land governance. These data sources can immensely contribute to periodic monitoring of SDG. However, there is lack of coordination among Government, Civil Society and Private Sector.

[8] Secure tenure rights are meant to imply that rights are legally recognized and the subject as well as boundaries clearly identified

[9] Tenure is perceived as secure if the household does not perceive a risk of land use or ownership being threatened or disputed.

Table 3: SWOT Analysis of existing data sources in India

	Strength	Weakness	Opportunity	Threat
DILRMP	Based on legal land records, reports plot level information on ownership; most of the states have digitized land records;	Data not available for most states; difficult to extract and report; May differ from actual situation as records are updated	GoI has directed all states to add 'gender' parameter; resurvey ongoing to update records; universalization expected soon under DILRMP aiming Titling	Gender parameter required to be added to millions of old records (viz. Odisha alone has about 14 million LR), which may take more time; LR updating will also be tedious
Agricultural Census	Legitimacy, granularity (up to tehsil level), periodicity (5 years) and disaggregation across ethnic and land size; all population coverage; based on verification of land records in 90% of states along with that of actual status	Reports 'Operational holding'; treat gender of head of household as gender of land holder	WCA[10] , 2020 proposed the collection of sex-disaggregated land ownership data; Existing procedure collects ownership data and re-tabulates, therefore, can be made available, if GoI agrees; scope of linking with other databases viz. Census, IHDS and micro-studies to make the indicator more robust	Conflict with Land departments, in case reports paint a poor indicators; dwindling budget provision for the division
IHDS	Nationally representative statistically sound HH survey; reports plot ownership data (up to 3 owners per HH)	Data not available for 40% of districts; based on interviews	Availability of inheritance and tenancy data can be used to link women land rights to other dimensions	Acceptance of State and district land administration, data being based on interviews only; continuation of survey
LSMS/ DHS (NFHS)	Identified by UNSTAT and FAO as source for SDG indicator	Done once in India (1997-98) only for UP and Bihar India	State level household surveys can be organized in this line viz. Karnataka Household Asset Survey; Integrating land rights questions in NFHS	Acceptance of State and district land administration
Complementary data sources				
Socio-economic Caste census	Full geographical coverage; Disaggregation across caste and education	Land ownership data is not disaggregated by sex	Gender disaggregated information on land ownership can be reported	Done once in India in 2011; data extraction is little cumbersome
Population Census	Full geographical and population coverage Reliable: Conducted by government agencies Disaggregation across caste	Gives information on cultivator, hence not a complete measure of WLR Conducted every 10 years	Questions based on gender disaggregated ownership rights can be incorporated	One of the oldest surveys, might take time to make any changes in the questionnaire
Micro-studies	Provide actual and specific information for a statistically representative small population	Coverage is sporadic geographically and uncertain temporally	Data useful to validate macro data viz. Agricultural Census	Availability and continuity uncertain

[10] World Programme for Agricultural Census of FAO, which guides agricultural s census operations in 115 member states

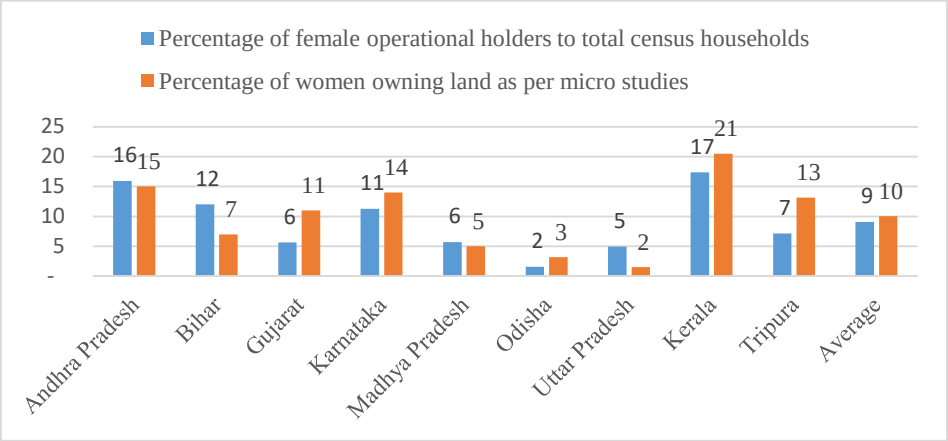


Figure 1: A comparison of percentage of women's land holdings (Agricultural Census, 2010-11 and Census, 2010) and percentage of women's land ownership (Micro Studies)

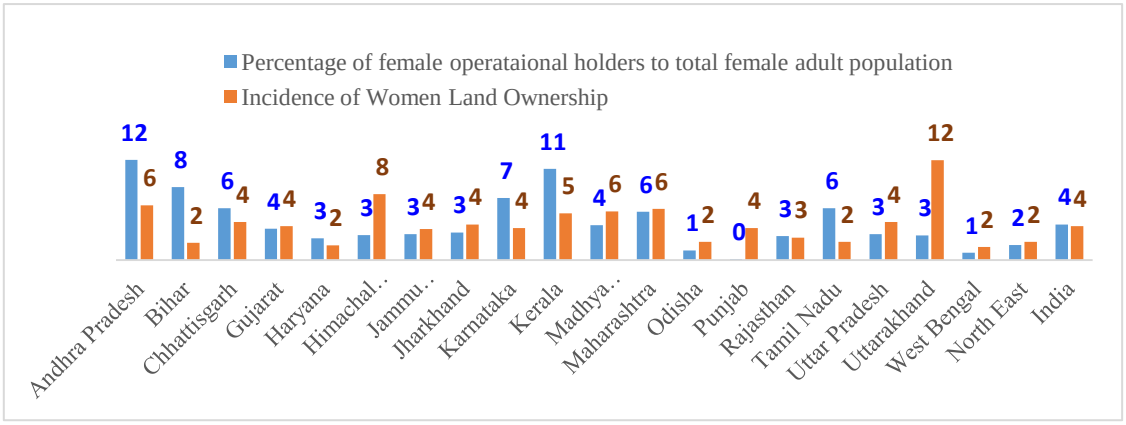
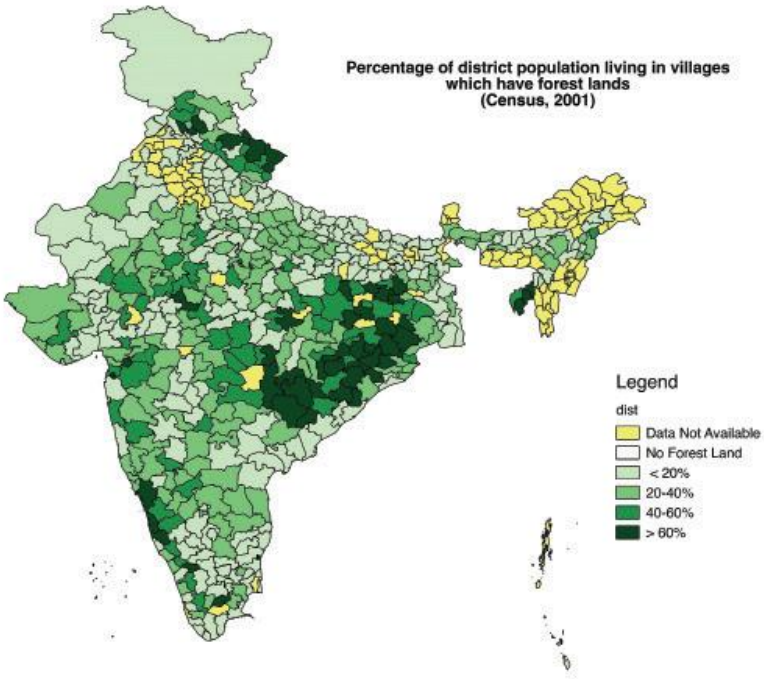


Fig 2: Comparison of percentage of Women Land Holdings (Agricultural Census, 2010-11 and Census, 2010) with Incidence of land ownership among women (IHDS, 2011-12)

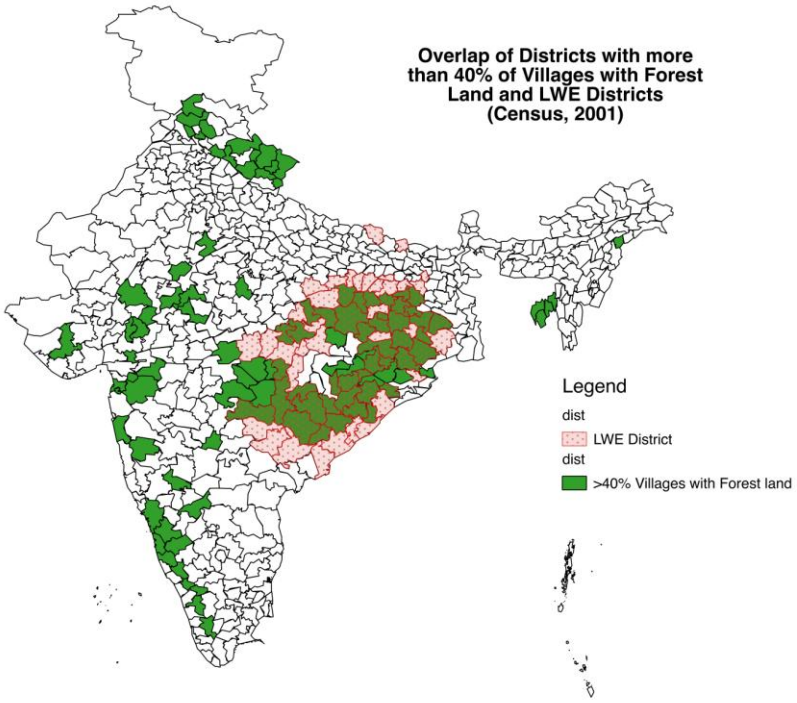
Analysis of the spatial and temporal variations in the women holdings indicate, comparatively better situation in states (viz. Andhra, Karnataka, Tamil Nadu, Maharashtra) that have amended Hindu Succession Act 1956, earlier to that by the Centre, have reduced stamp duty (Himachal Pradesh, Punjab, Uttar Pradesh, Madhya Pradesh, Haryana and Delhi) for registration of property in the name of women and where there has been more male out-migration. Some southern states, namely Andhra Pradesh and Karnataka, have at different times, purchased homestead or agricultural land to allocate land to landless women. This could have also contributed to more number of women's land holdings outcomes in these states. Civil society organizations and women's organizations are also playing a major role in safeguarding women's land ownership rights in states like Andhra Pradesh, Himachal Pradesh, Gujarat, Rajasthan, Odisha etc. The trends emerging are interesting and points to some potential linkages to legal, historical, cultural, political and economic practices and changes, indicating need of further research and investigation into the aspect, especially to create substantive evidence towards more informed gender-equitable policy and institutional reforms.

4.3 Assessment of CFR potential in India

Using the FSI data and meta-analysis of population census data, we calculated the estimated population (150 million including 90 million tribal) living in villages that have forest land within administrative revenue boundaries, potential area (40 million ha) that can be recognized under FRA and number of villages (0.17 million) that are eligible to initiate the claim. There are 120 districts, mostly located in the tribal areas of central India, where more than 40 percent of the population live in villages that have forest land and which are eligible for rights CFR rights recognition. Further districts with a high number of villages having forest lands are located in regions that have a tribal majority, are conflict prone areas, and strongly overlap with regions affected by left wing extremism.



Map 1: Percentage of population in the districts living in villages which have forest lands



Map 2: Overlap of districts with more than 40% of villages with forest land and LWE districts

This assessment has provided opportunities to relevant Government Ministries at Central and State level and civil society to expedite the forest rights recognition under India's largest land reform process.

5. Conclusion

India has made significant progress in data production, dissemination and use for development advocacy and informed policy making. The 'Digital India' initiative has further brought in a revolution in production of administrative data on various parameters including land. However, the demands for production of internationally comparable data is emerging specifically after the implementation of the SDGs. The present analysis indicate the availability of potential datasets to begin with though, there are needs to improve clarity, comparability and coherence in the existing data sources. A majority of the data sources lack desired

disaggregation (viz. gender, age, ethnicity etc.) and granularity. Data sources like Agricultural census must consider reporting agricultural land ownership data along with operational holding data periodically to track the relevant SDG indicator. This will be very easy to execute in view of the fact that ownership data is also being collected, during Phase I of the Census from village land records. . Implementation of a common land tenure module will help in ensuring quality and standard data production. Application of information technologies and multi-stakeholder-collaboration in data production and data-convergence (from different sources) will significantly help in improving data-quality, reliability and access and in meeting the global standards. Open-access availability of such data with scope of integrating indicator-building user-interface would expedite periodic and public monitoring and help stakeholders and policy makers in making more informed decisions. Thinking about an institutional platform connecting land data-agencies (viz. Division of Agricultira; Census) with policy makers (viz. DoLR or Niti Ayog), may be a starting point towards institutionalization of proactive data integration into land-policy space

6. Acknowledgement

Authors acknowledge with thanks the support of the World Bank, India for carrying out the study on Women Land Rights Mapping in India and that of Rights and Resource Groups, Washington for carrying out Potential Forest Rights Mapping in India.

7. References

[1] Agarwal, B. 2002: "Are We Not Peasants Too? Land Rights and Women's Claims in India" SEEDS Pamphlet Series 21 (New York, NY: Population Council), available at http://ccc.uchicago.edu/docs/AreWeNotPeasantsToo.pdf

[2] Agarwal, B., 1994. A field of one's own: Gender and land rights in South Asia, Cambridge University Press, Cambridge.

[3] FAO. 2012. Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security, available at http://www.fao.org/docrep/016/i2801e/i2801e.pdf

[4] FAO. 2015a. Gender and Land Statistics. Recent Developments in FAO's Gender and Land Rights database. A technical note.

[5] Lenard, Thomas M. and Rubin, Paul, H. (2013). The Big Data Revolution: Privacy Considerations. 1099 NEW YORK AVE, NW

[6] OECD (2015). Strengthening National Statistical Systems to Monitor Global Goals, Element 5, Paper 1. Available at https://www.oecd.org/dac/POST-2015%20P21.pdf

[7] UNSTAT (2016). Metadata compilation, Metadata Goal-1. Available at http://unstats.un.org/sdgs/files/metadata-compilation/Metadata-Goal-1.pdf.