

# **Informal Settlers: Identifying the Genuine Settlers and Landless of Nepal**

**Reshma SHRESTHA, Janak Raj JOSHI, Jagat DEUJA, Uma Shankar PANDAY,  
NEPAL**

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## **SUMMARY**

According to the World Cities Report by UN-habitat, an estimated 1.6 billion people live in inadequate housing globally, of which 1 billion live in slums and informal settlements. With its characteristic, informal settlements are defined as settlement that occupies land without legal ownership and has been in the dyadic dichotomy of legal and illegal. Conceptually, informal settlements are in "grey space," the space positioned between "whiteness" of legality and "blackness" of eviction. Nonetheless, some studies suggest certain legitimacy within this 'grey space,' defined as social legitimacy.

The Government of Nepal had formulated a commission, named as Land Issues Resolving Commission (LIRC). The commission aims to resolve land-related issues by transforming so-called socially legitimate rights of informal settlers towards legally legitimate rights by providing legal recognition and secured land for housing and agriculture. The National Land Policy (2019) aimed at addressing the issues of land tenure, ownership, rights, access, and use in an integrated way. Similarly, the 8<sup>th</sup> Amendment on Land Act 2020 direct towards the provision of allocating land to landless Dalit, landless Sukumbasi, and informal settlers. Therefore, Land Policy (2019) and 8<sup>th</sup> Amendment on Land Act 2020 was the governing documents for the LIRC mandate.

Regardless of the various intervention strategies undertaken by various government as well as non-government organizations for managing the land and housing issues of informal settlements, the pertinent questions arising are "How to identify the genuine informal settlers?", "Who are the real beneficiaries of the intervention?". To tackle these questions, the land commission has developed an innovative socio-technical approach based upon the concept of Fit For Purpose Land Administration (FFP LA) for identifying and preparing the baseline data of landless Dalit, landless Sukumbashi, and informal settlers. This paper aims to describe this innovative approach of identifying the real beneficiaries to be included in the government program of providing secured land for housing and agriculture. In the end, this paper will

highlight the way forward to overcome the challenges of this approach and further study to be carried on.

## 1. INTRODUCTION

Informality has been considered as a global issue that is intact basically with the people to the land relationship. Most of the general characteristics of informality is a lack of recognition in the legal system regarding the relationship that exists between settlers and the land they have occupied. In this regard, the study by Shrestha et al. (2016) has already highlighted the dichotomy between formal and informal, legal and not legal. The study has indicated the dimension of various types of legitimacy: legal legitimacy and social legitimacy. The authors have already argued that although the informality is a byproduct of the lack of legal legitimacy, the other types of legitimacy like social legitimacy (Suchman, 1995) and market legitimacy (Suchman, 1995) are pertinent that bring the settlement in the position of blurriness between formal and informal. Justifying the continuum between formality and informality in the case of informal settlements, there is global level evidence about how the perception towards the existence of these settlements has been changed but remaining the blurriness within informality.

Considering the blurriness within informality, the study of (Brooks, 2016) has mentioned the questions between “fake” settlers and “genuine” settlers. He has indicated that fake settlers are occupying the land just for getting land and housing from the government but they have their land and housing somewhere else. Hence, fake settlers are only capturing the land and deteriorating the environment and aesthetic view of the city. In contrast, there are “genuine” settlers as well who are real landless. In addition, it was claimed that these settlers are “city makers” and “land protectors”. They have been residing in the particular land for decades and have contributed making them habitable. Therefore, the holistic analysis of the views from federations of informal settlers: Nepal Basobas Basti Samrakchan Samaj (NBBSS)- Nepal settlement protection society and Nepal Mahila Ekata Samaj (NMES)- Nepal Women’s Unity Society (Tanaka, 2009), Lumanti Support Group For Shelter (NGOs), and other community groups were pointing out that there is no definition for “genuine” settlers and there exists no base information for differentiating between genuine and fake settlers. This has been pointed out by various authors in their studies

Despite the issue intact with “genuine”, the issue of the informal settlement is intermingled with various other issues such as political issues, housing issues, and land issues leading to its existence for several decades. This existence is associated with a prolonged struggle for legal recognition of the space that the particular settlers occupied. Tracing the history of various interventions, already reveals that the nomenclature of the issue seems to change from eviction to upgrading and legal recognition (Tanaka, 2009). It has been found that various activities and interventions have been carried out by the government and non-government organizations to manage the informal settlements per se.

Although there are various activities conducted by government and non-government organizations, the legal issues intact with informal settlement remain unsolved as the current land administration system of the country deals with the formal or statutory land tenure system only which means legal recognition is possible for the land registered in national cadastre. As mentioned in the study by Joshi et al. (2019), almost 28% of the country's area is arable. 75% of which is formally registered with secured legal tenure whereas 25% of the total arable land and settlement is outside the formal cadastre. This informal area is estimated to be approximately 10 million physical parcels on the ground. This indicates a significant amount of land is under informality which needs quick action for their formalization.

Considering the long pathway of solving the issues of informal settlers, there are several institutions formed under political decisions. It reveals that there were already eleven land commission has been formulated in the past year. This commission already distributed around 73,3424 hectares of land to 71,512 landless and informal households in various districts (MoLRM, 2013).

Regardless of the various intervention strategies undertaken by government as well as non-government organizations for managing the land and housing issues of informal settlements, the pertinent questions arising are "How to identify the genuine informal settlers?", "Who are the real beneficiaries of the intervention?". To tackle these questions, the Land Issues Resolving Commission (LIRC) has developed an innovative socio-technical approach for identifying and preparing the baseline data of informal settlers. This paper aims to describe this innovative approach of identifying the real beneficiaries that are landless and informal settlers to be included in the government program of providing secured land for housing and agriculture. The paper provides the way forward to combat the challenges of identifying genuine settlers.

## **2. INFORMAL SETTLEMENTS IN CONTEXT: LANDLESS DALIT, LANDLESS SUKUMBASI, AND INFORMAL SETTLERS**

The "informal settlements" are termed differently in various literature such as slums (Huchzermeyer & Karam, 2006), shanty towns (Lloyd, 1979), and squatter settlements (Willis, 2009). Although, the physical characteristic of squatter settlements resemble slums and, shanty towns the legal characteristic is different i.e. lacks the legal ownerships rights . These settlements are usually named differently in different countries - Bustees (in India), Favelas (in Brazil), Pueblo (in Peru), Kampong (in Indonesia), Barong-Barong (in the Philippines), Setinggan (in Malaysia), Chumchaon Bukruk (in Thailand) and Gecekondu (in Turkey) (Suditu & Vâlceanu, 2013; Willis, 2009), Sukumbashi Basti (in Nepal) (Shrestha et al., 2014). A study by Tanaka (2009) mentioned that there is an unclear representation of the diversified character of the informal settlements and settlers while using the general term of "Sukumbasi".

It is noticed that the Land Issues Resolving Commission (LIRC) has categorized the beneficiaries as landless dalit, landless sukumbasi, and informal settlers. According to the Land

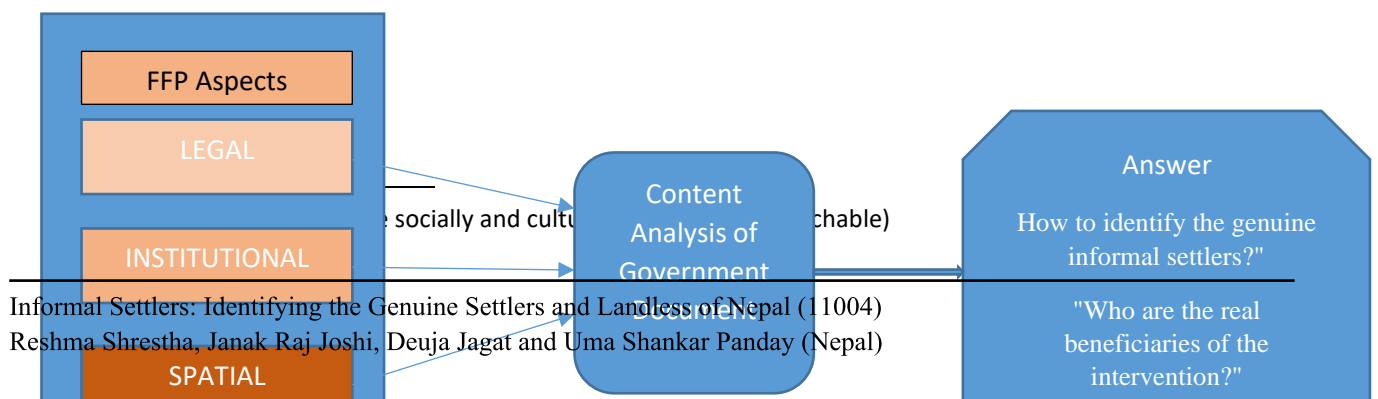
related act, 2020, “landless sukumbasi” indicates the people living in the land without formal tenure. To be within this criteria, these settlers including their family members should not have land with formal tenure rights within the country. Also, the settler including his family is not in the position of buying land due to economic conditions. It seems that there are similar criteria for Dalit<sup>1</sup>. Similarly, the clear definition of informal settlers from the government perspective is those settlers who have occupied the various types of land (Government, Aillani, Parti, forest land converted for residential or agriculture purpose) up having a minimum possession period of 10 years either by constructing the house for shelter or agriculture purpose.

Considering the land tenure characteristics, there is an explicit categorization of tenure types for registered and unregistered land. The brief history of the tenure system for registered land has been detailed out in various studies (Joshi et al., 2017; Shrestha et al., 2021). The types of land tenure in registered land are Raikar (Private), State, Guthi, Private, Government, and Public. Whereas the types of land tenure in the unregistered category are non-formal, informal, and encroachment. The non-formal category is described as socially accepted, legally recognized but is unregistered land. The informal category is described as socially accepted but is not recognized in a legal framework therefore unregistered in the name of occupier. Encroachment is described as socially not accepted, not recognized within a legal framework, and therefore unregistered in the name of occupier.

### 3. METHODOLOGY ADOPTED

This study is based upon the direct content analysis of government documents. As mentioned by Hsieh and Shannon (2005), indirect content analysis the code is predefined based upon the previously developed theory. Here, the analysis has been conducted considering the three core conceptual frameworks of Fit For Purpose Land Administration which are legal, institutional, and spatial, initially developed by (Enemark et al., 2016), and implementation strategy for Nepal by (Ministry of Agriculture et al., 2018). The content analyses from the reviewed documents are categorized within the FFPLA frameworks

- ✦ Task procedure for information collection and validation of landless “Dalit”, landless “Sukumbasi” and informal settlers at the local level, 2021(Government of Nepal, 2020b)
- ✦ Identification of landless Dalit, landless Sukumbashi, and informal settlers and validation basis and standard. Kathmandu, 2021 (Government of Nepal, 2020)
- ✦ Overview Book: Land Related Issue Resolving Commission. Kathmandu (Government of Nepal, 2020)



#### **4. PAST INITIATIVES AND INTERVENTIONS IN IDENTIFYING GENUINE INFORMAL SETTLEMENTS**

Looking at the highest level initiatives, it clearly outlined in the Constitution of Nepal which was promulgated in 2015 that access to land and housing is a fundamental right. Secondly, the National Land policy formulated based on the constitution of Nepal also spells out about recognizing pro-poor.

Besides, there have been various initiatives and interventions from the various governing sectors for instance sectorial government, NGOs, INGOs, civil society. The initiatives vary from eviction, upgrading, relocation, land access. The critical part of any intervention is about identifying the genuine settlers.

##### Cases of an initiative of government towards clearing invaded land and relocation plan

The “eviction” approach was adopted on the 8<sup>th</sup> of May 2012 to clear the invaded land by the informal settlers. This eviction was a part of the government project namely “Integrated Development of the Bagmati Civilization (IDBC)” for cleaning up the Bagmati River that was highly polluted due to haphazard settlement near the bank of the river. It reveals that before eviction, the government had taken an initiative to relocate the settlers by identifying the genuine settlers and also had planned to provide an alternate location to settle them. The approach adopted for identification is the self-declaration form and their verification directly by officials from the Department of Urban and Building Development Construction (DUDBC). The process was not successful and the government could not convince the settlers to be relocated. Hence, the eviction approach was adopted. [see (Shrestha et al., 2014) for details of this case]

##### Cases of relocation of informal settlers (Kirtipur Housing Project)

The Kirtipur Housing Project (KHP) is a resettlement project of informal settlers residing along the bank of the Vishnumati River in the Kathmandu Valley. This project has been reflected as a successful relocation model that has been carried out by Lumanti (NGO). The informal settler’s federation, the settlers themselves including local level government were also involved during the relocation process. In this project, the identification of genuine settlers was crucial. The process of identifying the genuine settlers was carried out in two stages. In the first stage, the settlers themselves produced the list with ownership details, date of settlement, family size,

and income details. The list was tallied with the official records of the ward office. Out of 142 families, only 62 families were identified as genuine settlers according to the set criteria of the project. From the list, the settlers owing other property and having income more than Rs. 3000<sup>2</sup> were excluded from the beneficiaries list. In the second stage, the settlers were allowed to opt the relocation process voluntarily. In this second stage, additional 32 families voluntarily left the process. Hence, the final list of beneficiaries was down to 30 from an initial list of 142 households [see (Sengupta & Sharma, 2009; Shrestha et al., 2018) for details of this case]

Both the cases mentioned above have a critical stage of identifying the genuine settlers. The first case shows that the lack of community-level involvement and participatory approach can be one of the factors in not being able to identify the genuine settlers. In the second case, the community-level initiative has been adopted in identifying the genuine settlers. However, in the second case, the criteria set was only at the project level since there was no national-level framework for identifying the genuine settlers. Therefore, it can not be guaranteed that the same model adopted at KHP can also be applied for another project. Various studies [(Brooks, 2016; Kaplan & Shrestha, 1982; Manandhar, 2019; Shrestha, 2019) have already indicated the need for the national standard and procedure for identifying the genuine settlers residing with the informal tenure.

## **5. PRESENT INITIATIVES TOWARDS IDENTIFYING GENUINE INFORMAL SETTLERS**

The “Land Issues Resolving Commission, 2020” has been formed by the Nepalese government. The main objectives of this commission are to provide land to the landless informal settlers and managing the informal settlements. The decision of formulating the commission was on 18<sup>th</sup> march 2020. This commission holds the mandate with some specific principles of governance like transparency and accountability. It reveals that the commission objective is based on the holistic approach of sustainable development rather than simply the provision of land to the informal settlers. The set objectives of the commission are (Government of Nepal, 2020a):

1. To identify and validate the detailed information of landless “Dalit”, landless “Sukumbasi” and informal settlers
2. To provide planned, collective, and safe housing for the family that lacks housing
3. To provide legally recognized land rights to the landless “Dalit”, landless “Sukumbasi” and informal settlers who are based on the agriculture practices
4. To develop the planned settlements and contribute to productivity by facilitating the implementation of a land use plan
5. Resettlement of the settlements that resides on the land that falls under hazard risk and is identified as not suitable for residential purpose.

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<sup>2</sup> The conversion rate of US dollars varies with exchange rate of 1 US Dollar is equivalent to 100 and 120 from last decades

6. To end the inequity in the labor market due to unequal land distribution

Yet, following the above mentioned targeted objectives, the commission has already commenced its activities towards its first objective which tends to answer the pertinent questions that remained unanswered for several decades

*"How to identify the genuine informal settlers?", "Who are the real beneficiaries of the intervention to provide legal recognition of occupied land?"*

### **5.1 Fit For Purpose Land Administration (FFPLA) as an approach for identifying genuine informal settlers**

The globally recognized framework Fit for Purpose (FFP) land administration (Enemark et al., 2014) seems to be the basis of developing the informal tenure recognition framework. The initiatives are taken by the Nepal Government (then Ministry of Agriculture, Land Management and Cooperatives, now Ministry of Land Management, Cooperatives, and Poverty Alleviation) with support from Community Self Reliance Centre and UN-Habitat, Nepal Country Office in translating the global framework of FFPLA in the country context has become the key basis for developing the framework that answers the questions about *"How to identify the genuine informal settlers?"*.

Hence, in particular, to answer this question, the government has attempted to lay down the conceptual framework of FFPLA calibrated for the Nepalese context. The FFPLA Country Strategy for Nepal consists of three core pillars namely: Legal, Institutions, and Spatial. As explained in (Joshi et al., 2019), the legal pillar accommodates the provision of legal components for adjudication and recording of land rights. The institutional pillar refers to the provision of service delivery related to land with a certain institutional setup. The Spatial pillar is related to the mapping of visible or physical boundaries on the ground. These aspects of FFP have been seen to materialize in meeting the first objective of land commission as highlighted in section 4.

Legal Aspect	Institutional Aspect	Spatial Aspect
Land Policy Spells about recognition of land rights of pro-poor	Formulation of land commission at State level  Formulation of the committee throughout the 77 districts	Application of various technical support to delineate parcel-based information:  Use of modern geospatial technologies like Satellite

The 8 <sup>th</sup> Amendment on Land Act 2020 has a legal basis for formulating the commission	Formulation of municipality and ward level unit for capturing detailed information of beneficiaries	Images, UAVs in dense settlement Use of Total Station to collect the data of the occupied land
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### 5.1.1 Legal Aspect:

The legal aspect of FFPLA indicates the amendment in the legal framework to facilitate the purpose required to be fulfilled with a specific time frame and with the targeted outcome. In this regard, it can be argued that the eighth amendment made in Land Act 2020 has been a strong legal basis for recognizing the land rights of people having informal tenure arrangements and informal settlements. The section “52 Kha<sup>3</sup>” mentioned some general criteria to be followed for providing land to the landless “Sukumbashi”. This section spells specifically that “whatever has been written in law”, but the provision has been opened up for distributing the land to the landless for a single time. It reveals that this particular phrase in the legal document can reflect the flexibility created in the legal framework to fit the purpose.

The basic criteria set for managing access to land issues for landless “Sukumbasi” are as follows:

- ❖ Providing the land at the same location unless it is not possible to allocate in the same location due to land use restriction
- ❖ The allocated area should be within the pre-set threshold otherwise the area greater than the threshold will be taken by the government for redistribution to other landless.
- ❖ The allocated land are restricted for formal transaction in the land market for 10 years. However, the transfer under inheritance property law is possible.
- ❖ The land which will not be considered for distribution are
  - ✗ Under religious, cultural preservation
  - ✗ Protected measure for disaster
  - ✗ Land on the river bank requires biodiversity, flora & fauna, forest area, etc.
  - ✗ Land of strategic importance
- ❖ The settlers must not have received land from the government in the past
- ❖ According to necessity, the government can arrange the land for collective housing through land development approaches for the informal settlers of an urban area like in the Kathmandu Valley.

### 5.1.2 Institutional Aspect

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<sup>3</sup> “Kha” refers to Second Letter of Devanagari



The institutions are the critical supportive framework for the implementation of the legal aspect. It reveals that the institutional framework has been developed with vertical integration between three-tier governments. The commission formed at the federal level under the Ministry of Land Management Cooperatives and Poverty Alleviation is mandated for the identification of the informal settlers, landless Dalits, and landless Sukumbasi nationwide. To facilitate and coordinate the mandate set for commission, the district level committee consisting of a chairman from the national level, one expert member, three members from sectoral institutions (District Survey Office, Land Revenue Office, and District Forestry Office), and a member secretariat from the District Coordination committee office. In total there will be a committee at the district level. The district-level committee has the mandate to coordinate with the province level and also the local level community. Besides that, the specific mandates are capacity building at the local level, solving the land-related conflict at the district level as far it can be possible, monitoring the work of the local level community. Similarly, the facilitating committee is formed for helping local level committees. The facilitating committee consists of, a representative from women and marginalized groups besides representative from the local level, technical personal, etc. It can be said that the formulation of the committee seems to follow the inclusive norms. Also, the committee formulation is fit for representing the multi-stakeholders.

### 5.1.3 Spatial Aspect

The spatial aspect is related to the measurement of occupied land on the ground and preparation of maps for deciding for allocating the land with the support from the spatial information like existing location, area, types of land use, etc. The demarcation of the physical boundaries of informally occupied land is very important. To do so, the use of some spatial technologies has been spelled out in the task procedure (Government of Nepal, 2020b).

The initial procedure starts with the formulation of a land measurement team consisting of surveyors. In addition to traditional approaches of ground-based surveying using survey instruments like total station, the use of participatory GIS (PGIS) with the use of satellite images for demarcation and adjudication of physical boundaries and also mapping the types of tenure the particular settlers are holding, has been spelled out in task procedure. According to the purpose and its applicability, the ground-based survey has been suggested for the area where physical boundaries are not clear due to dense settlement whereas the application of geo-referenced image, captured from low-cost technology like Drone/UAVs [See details about the application of UAVs and its regulations (Shrestha et al., 2019)] has been mentioned to be applied in the area where the boundary is clear (basically in the plain area with less dense settlement).

As mentioned by Joshi et al. (2019), the spatial framework of FFP LA for mapping informal tenure should have some parameters like fast, cheap, and good enough accuracy that must

support the purpose. In this aspect provision of formulating standard operating procedure (SOP) with the application of some specific technology seems to be one of the key factors for supporting FFP LA parameters. Also, the task procedure has mentioned detail technical procedures to follow while mapping the occupied land. For instance, the image resolution should be 0.5m or higher with geo-referenced and Orthorectified, sufficient number of control points while acquiring images from Drone/ UAVs.

## 5.2 Criteria for identifying the genuine informal settlers

As it was discussed in section 5.1 about “*How to identify the genuine informal settlers?*”. Aligning with this question, the answer to the second questions “*Who are the real beneficiaries of the intervention to provide legal recognition of occupied land?*” seems to receive from analyzing the document on “Baseline information collection procedure for landless Dalit, landless Sukumbasi and informal settlements” (Government of Nepal, 2020b)

To identify the genuine beneficiaries, the three core process is adopted

STEP 1: The detailed situation analysis of informal settlements at the local level by local government

STEP 2: Detail Information collection and educate and trained the local facilitator.

STEP 3: Measurement and Mapping

### 5.2.1 STEP 1: The detailed capacity analysis of local unit and preliminary information of informal settlements within Jurisdiction

It is the first step towards identifying the real beneficiaries. In these steps, the self-capacity of the particular local unit in terms of both technical (total station, Plane Table) and human capacity (surveyors, civil engineer, IT officer, etc.) needs to be given. Also, the preliminary information regarding the total number of household unit of landless Dalit, landless Sukumbasi, and informal settlements the following information are required to be collected

- ❖ Area of occupied land and its types categorized as “possible to distribute” and “not possible to distribute”. The detail categories are as follow

Possible to distribute: “Ailani Jajja”<sup>4</sup> suitable for settlement, government land suitable for settlement, and forest land that has been converted into a settlement

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<sup>4</sup> Ailani Jagga refers to land that is unregistered

Not possible to distribute: Land that holds religious, cultural, and archeological value, land required for protection in terms of disaster management, public land, riverbank, land at-risk zone, National preservation area, dense forest area, right of way, private land, important land for government and land that has not been categorized for agriculture and residential purposes.

- ❖ The identification of local level organization, community groups, NGOs that can collaborate in the process of collecting baseline information of the beneficiaries.

### 5.2.2 STEP 2: Detail Information collection and awareness-raising

This is the second step in which the detailed information of the beneficiaries (landless Dalit, landless Sukumbasi, and informal settlements) will be collected. Two separate standard forms have been developed: *Form no. 3* for landless Dalit and landless Sukumbasi, *Form no. 4* for informal settlers. These forms are filled up on behalf of the beneficiaries. It reflects that beneficiaries themselves are providing their information and also it is a self-declaration form. This step has created self-responsibility and accountability in the case of false information.

The form has been designed to obtain various types of information both for landless Dalit and landless Sukumbasi and informal settlers as below with slight variation in both cases:

Non-spatial information (both cases) like detailed household information of three generations, information on citizenship, income source and dependency, duration of occupancy, proof of occupancy like water/electricity bill, a recommendation from the local level to occupy that land, legally recognized building plan, etc, use of occupied land (either for settlement or agriculture).

Spatial information (both cases) like plot no. from cadastre (if available), detailed location of the occupied land, area of occupied land.

Social information (landless Dalit and landless Sukumbasi): Like reasons that have made the family land less Sukumbasi (disaster, land acquisition for development, no land from ancestor, land sale for loan repayment, etc.), proof of not have been received any land from the government in past or status of an application for access to land submitted in a past context. Also, self-declaration of not having land in name of any family member anywhere else, do not have enough financial resources to buy land, have not received land from family members from the government.

Socio-Economic Status (informal settlers): Like the economic status of informal settlers in terms of income source of households, types of materialistic use, owned vehicles, schooling of children, etc. The method of occupation of the particular land where informal settlers reside like permanently occupied, temporarily occupied, occupied through the third person. Types of

occupied land (Ailani land, government land, or forest land converted into settlement), Length of occupancy based on the recommendation from the local level, area of land that exists elsewhere in the name of family members. Besides, there is a self-declaration section where the settlers need to declare that they have occupied only that particular land, they have not submitted applications from other places, and also they have not received any land from the government in past.

All the above-mentioned information will be cross-validated by the local level after detailed cross-checking for the provided information.

Also, the capacity building component is included which refers to educating the process and providing the technical training. Each local government appointed the enumerators and social mobilizers for information collection and facilitate the process, organized training and orientation at the local level before information collection.

### 5.2.3 STEP 3: Measurement and Mapping

The measurement and mapping technique is based on the standard operating procedure of the commission guided by the land measurement act, land measurement regulations. The field officer should receive the application registered number for the particular area and should be linked up with the standard *form 8* before starting the survey and measurement procedure. While conducting measurement, the field officer should note the type of current use like (agriculture, house, garden, pond, road, etc.) and also need to indicate the types of a zone as indicated in the land use policy (like agriculture, residential, industrial, mines, forest, river/pond, public, cultural/ archeological).

To reduce boundary conflict of the occupied land, the consensus between the neighbor occupiers is required to be built. Until and unless all the boundary conflicts are solved, the measure of the particular plot will not be carried out. The conflict should be solved by the local level committee otherwise the measurement will be carried out as a single block for the whole conflict area.

## **6. CHALLENGES AND WAY FORWARD**

The intervention that the government has taken based upon the FFP approaches for solving land issues of land-less groups and informal settlers particularly fill the gap between legal legitimacy and social legitimacy. The content analysis of the various documents prepared as detailed guidelines for implementing the amendment act of distributing land to the genuine informal settlers and land fewer groups seems very comprehensive. It reveals that pertinent

questions that have been raised for decades about identifying the genuine beneficiaries can now be answered.

However, there are some challenges. The capacity (both in terms of human and technical capacity) of all the local levels is compatible with the set norms of the document or not. The completion of identifying the genuine settlers' in terms of both their existence period and land occupancy area can be challenging if land encroachment activities increase in the given time frame.

The way forward to combat these challenges is, firstly to develop the human and technical capacity. Secondly, the initiative with desktop spatial analysis using geospatial technologies in feature extraction and demarcation of physical boundaries. The low cost technology like UAVs can be adopted for acquiring the images required to do the spatial analysis. The time series analysis using simple google images can be the fast method to identify genuine settlers in terms of their occupancy period.

Further, it is recommended for an in-depth impact analysis of the intervention after providing the land ownership certificate with a disposal restriction of 10 years. Also, it is recommended to analyze the tradeoff between fast, cheap and good enough accuracy of the adopted spatial framework while identifying the genuine settlers and process of land allocation.

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## **BIOGRAPHICAL NOTES**

Reshma SHRESTHA is an Assistant Prof. in the Department of Geomatics Engineering at Kathmandu University. She has more than six years of experience in the academic field. Besides academics, she has professional experience in many projects related to the application of geoinformation technology in land management. She was Co-chair for the working group in FIG commission 2 from 2015 to 2018. Her research interest is in Urban Land Governance, Land Administration, Land Use Planning, Urban Planning and Management, Land Readjustment, Geo-information Technologies and capacity building in geoinformatics. She

holds PhD in the Title “Understanding Urban Land Governance through” Action Space”: Implications for Access to Land for Low-Income Housing in Managing Informal Settlements” from the Faculty of Geoinformation Science and Earth Observation, University of Twente

Janak RAJ JOSHI is a Joint Secretary at the Ministry of Land Management, Cooperatives and Poverty Alleviation of the Government of Nepal. He has more than 2 decades of experience in Land Surveying, Land Administration, and Management in the Government sector. He is one of the key land professionals leading the formulation process of Land Use Policy 2015, National Land Policy 2019, Land Use Act 2019, and Lands Act 8th Amendment 2020. He led to introduce the Fit for Purpose Land Administration, National Strategy, based on which the Land Issues Resolving Commission (LIRC) is currently working to ensure the secured land right for all in Nepal. Besides his Government duty, he has been actively involved in academic activities in the field of Surveying, Geoinformatics, and Land Administration and Management. He holds M.Sc. in Geoinformation Science and Earth Observation (With Distinction) degree from the University of Twente, ITC, the Netherlands.

Jagat DEUJA joined the land rights movement in 1996 and advocating to ensure the land rights of landless, tenant farmers, evicted communities, ex-bonded laborers, and other disempowered groups who are unable to access land to facilitate their rights to food, housing, and an adequate standard of living. He frequently writes about land rights and land reform issues at the national media. Currently, He is working as an expert member of LIRC and before to joined the commission, He was an executive director of Community Self Reliance Centre (CSRC)

Uma SHANKAR PANDAY is an Assistant Professor at Department of Geomatics Engineering, Kathmandu University. He has been working at the University since 2013. He specializes in Photogrammetry and UAV. He leads several research and development projects at the university. He has been serving as Geospatial Experts in various governmental and Non-Governmental projects.

## CONTACTS

Dr. Reshma Shrestha  
Kathmandu University  
Department of Geomatics Engineering  
Dhulikhel  
Kavre  
NEPAL  
Tel. +9779841295224  
Email: [reshma@ku.edu.np](mailto:reshma@ku.edu.np)  
Web site: [www.ku.edu.np](http://www.ku.edu.np)