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The Contribution of Land Registration and Certification Program to Implement SDGs: The Case of the Amhara Region, Ethiopia

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Abstract: Land is the key asset in the agricultural sector and hence land policy is one of the key elements that determine whether SDGs are achieved in developing countries or not. In developing countries, land titling programs have been seen as a strategy for addressing SDGs. Even though the government of Ethiopia launched the rural land registration and certification program (LRCP) to secure the land rights of rural households in 1998, currently, there are limited empirical studies to examine the contribution of LRCP in addressing sustainable development goals (SDGs). This study is employed to fill this knowledge gap by assessing how LRCP supports the achievement of the UN SDGs. The research data were collected through key informant interviews, in-depth interviews, focus group discussions, and reviewing published and unpublished documents. Content analysis, narrative analysis, and SWOT analysis were applied to examine the research data. The study confirms that LRCP improves tenure security, which greatly contributes to the achievements of SDGs, such as SDG 1 (end poverty), SDG 2 (end hunger), SDG 5 (gender equality), and SDG 15 (life on land). The tenure security of rural societies is a key pathway for the achievement of SDGs in Ethiopia since their livelihood mainly depends on agriculture. Therefore, developing countries should focus on land rights to improve the livelihoods of rural societies in particular and to enable sustainable development in general.

Keywords: rural; land; registration; certification; SDGs; ethiopia



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1. Introduction

A lot of people in Africa depend on agricultural production, both for consumption and as a source of income [1]. The land is a basis for shelter, services, and also a source of financial security [2]. Therefore, the land is the most important socio-economic livelihood asset for the majority of rural dwellers in developing countries, being used as a source of power, status, prestige, and wealth of people [2–5].

In developing countries, access to land is necessary for households to secure food and generate income [2]. Access to land rights is crucial to improve land tenure security and the wellbeing of rural households [6], and it is important for economic development, social stability, and environmental management [7]. Thus, tenure security is a key for poverty reduction, food security, gender equality, cultural survival, environmental sustainability [5], and in general for the sustainable development of a nation [2].

In many places, especially in Africa, there are broad sets of laws about property ownership, including different customary, religious, and statutory laws, and traditions. This

diverse nature of customary land tenure systems threatens tenure security and agricultural production in Africa [8,9]. Like in other African countries, the land tenure system was the main bottleneck of rural development in Ethiopia [10]. It is one of the root causes of the underdevelopment of Ethiopia as it affects rural societies' access to land [11].

As a result, land policies are required to improve tenure security and maintain land transactions in developing countries [6]. Securing land rights requires developing and implementing policies as well as legal and practical tools tailored for different groups and circumstances, and paying special attention to the specific needs of vulnerable groups [2].

Land administration is about the common tenure processes, such as titling of land, transferring of land, and establishing a cadastre [12]. Hence, good governance in land administration protects the property rights of individuals [7].

A sound land administration system is key to protecting land rights and maintaining sustainable development by integrating records of land ownership, land value, and land use with sociological, economic, and environmental data [13]. Moreover, strong institutional arrangements and procedures are crucial for the successful implementation of a sustainable land administration system [14]. Modern land administration systems comprise an extensive range of processes to manage land tenure, land value, land use, and land development, which facilitate economic, social, and environmental sustainability [12,15–17].

Generally, land tenure security is a key component of the strategies to reduce poverty in many developing countries [18]. As a result, many African countries have recently changed their land legislation and/or institutional setups intending to recognize land rights and provide tenure security in new and innovative ways. This can be achieved by establishing a countrywide land administration system at affordable costs, which can be upgraded flexibly [19].

Securing land rights is recently recognised as a key strategy for the achievement of global sustainable development agendas [20]. Reforms of land administration systems in developing countries are a precondition to achieving the UN Development Goals [21] and to strengthening the tenure security of rural societies, since the diverse nature of customary land tenure systems in developing countries threatens the tenure security of rural households [6]. The 2030 UN development goals, especially Goal 1 (end poverty), Goal 2 (end hunger), Goal 5 (achieve gender equality), and Goal 15 (life on land), particularly call for paying attention to access to and control over land as well as to sustainable management of land and associated resources. Hence, a modern land administration system, including formal land registration, titling, and certification, has been perceived as a precondition to secure property rights and agricultural development [22]. For positive societal changes, land tenure should be administered properly by establishing formal land titling procedures [23].

Land and its resources are the backbones of most developing countries. The land is one of the key elements that determine whether SDGs are achieved or not [24]. Consequently, in various developing countries, land titling programs have been seen as a strategy to address SDGs by improving tenure security and creating a favourable environment for land-related investments. Land tenure reform has become a significant area of policy-making in many African states in recent years and international organisations have been heavily involved [25]. The importance of good governance in land administration is highly relevant to the agendas of all countries, whether developed or developing [7].

Recently, developing countries focus on strengthening their land administration systems to ensure security for rural societies. Several countries in Africa have either formulated their land policies or are in the process of doing so [1]. Many African countries reformulate land policies to regulate and administer land rights of the societies [26]. Land registration and titling in Africa is often advocated as a pro-poor legal empowerment strategy [27], since in areas, where customary land tenure systems govern access to land, most land remains unregistered and without formal ownership or use rights documents [28]. So, formal land administration institutions [6] and land certification and registration programs [29] are currently implemented in many African countries.

In Ethiopia, the rural land registration and certification program (LRCP) is recently implemented with the support of international donors/development organizations, such as USAID, DFID, and WB. Ethiopia has implemented two successive rural land registration programs since 1998: the first and the second-level land registration and certification programs. The first level of land registration allocated and registered landholding rights to households. The first stage does not include a spatial coordinate or map of individual parcels on the certificate. The assessment of this information is the aim of the second level LRCP by providing parcel-level mapping and digitizing. LRCP also supports integrated land use management and planning activities [30–32].

The strategies of sustainable development and poverty reduction of the Ethiopian government emphasize the land registration and certification process to guarantee land tenure security. It is a vital tool for farmers to invest in their land and improve productivity [22]. The aim of Ethiopia's rural land administration and use is to maintain the sustainable management of natural resources and increase agricultural productivity by improving the land tenure rights of rural societies [33]. Moreover, the Ethiopian government has emphasized equal land rights for women while rural LRCP is designed and implemented throughout the country. LRCP has been implemented throughout the country to ensure more sustainable use of land resources, facilitate gender equality, and improve access to land and the wellbeing of rural households.

Accordingly, land registration in the Amhara National Regional State (ANRS) has been implemented since 2002. The first level of registration and certification (issue of land certificates) is completed in different zones of the region. Currently, the second level of land registration and certification (surveying of parcel boundaries) is being conducted with the support of NGOs. However, there are limited scientific investigations on the contribution of LRCP to the implementation of the SDGs in Ethiopia in general and in the Amhara region in particular. Therefore, this study is employed in the Amhara region to fill the current knowledge gap with the aim of examining the contribution of LRCP to the achievement of SDGs. Based on the above theoretical backgrounds land tenure security/rights is the major indicator for achieving the SDGs in developing countries. Therefore, the current study investigated whether the LRCP improves the land tenure security of rural households, and thus contributes to the achievement of the SDGs. Accordingly, the strengths, weaknesses, opportunities, and threats (SWOT) of the LRCP for the implementation of SDGs and their targets are assessed and discussed.

2. Materials and Methods

2.1. Study Area

This study is conducted in the East Gojjam zone of ANRS. The ANRS is one of the biggest regions in Ethiopia and covers a total land area of 170,152 square kilometres. The majority of the population (about 89 percent) are farmers, who rely on subsistence farming activities, while the remaining 11 percent of the population are urban dwellers [3].

East Gojjam is bordered on the south by the Oromia Region, on the west by the West Gojjam Zone, on the north by South Gondar Zone, and the east by South Wollo Zone. Its highest point is Mount Choke (4100 m above sea level). Two representative woredas (districts), namely Gozamin and Machakel, are selected to collect the study data, as in both woredas the land registration, as well as the certification program, were implemented (Figure 1).

2.2. Data Sources and Analysis Tools

Primary and secondary types of data were collected for the investigations. Key informant interviews, in-depth interviews, and focus group discussions are employed to collect the primary data. The secondary data are collected by reviewing published, unpublished, and official documents and legal frameworks.

For the analysis of the research data, a SWOT analysis (strengths, weakness, opportunities, and threats), content analysis, and narrative analysis were used. The SWOT analysis was carried out to understand the overall contributions of LRCP to the achievements

of SDGs. Moreover, our studies [34–36] are discussed in line with the achievements of the SDGs through the LRCP. In this way, the results documented below are based on 548 household surveys with landholders (141 male-only, 117 female-only, 290 joint-titled) and with 285 female-headed households, on 9 key informant interviews, on 6 focus group discussions, and 16 in-depth interviews conducted with female-headed households.

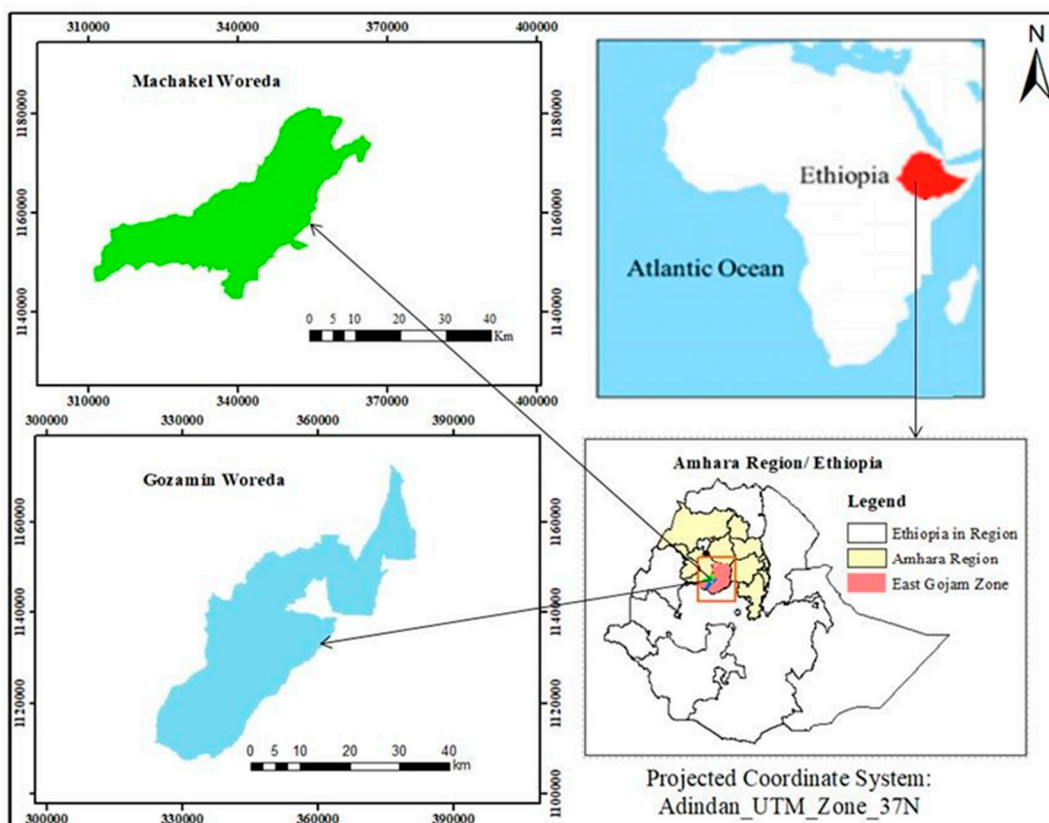


Figure 1. Map of the study area.

3. Results

In the study, the SWOTs of the rural LRCP were analysed and their contributions to the achievement of SDGs and their targets were identified.

3.1. The Impact of LRCP on Rural Societies

To understand the overall contributions of LRCP to the achievements of SDGs, the general contributions of LRCP to the local people were assessed. Table 1 summarises the results on the impact of the LRCP on the rural society in the study area. Details on the individual points are described in this chapter.

3.1.1. Strengths of LRC

Legal frameworks and administration institutions established

The federal government and the regional governments enacted rural land administration and land use proclamations to manage rural land and to facilitate the implementation of LRCP. They established land administration institutions with the responsibility to manage and administer rural land. In ANRS, the Environmental Protection Land Administration and Use Authority (EPLAUA) was established, which is responsible to implement LRCP and other land related issues.

At the federal level, two directorates of the Ministry of Agriculture are responsible for the administration and management of rural lands, as well as for the lease of state holdings. In addition, the Ethiopian Mapping Agency is responsible for the management

of the spatial aspects, e.g., for the preparation of land use/land cover maps and for the maintenance of geodetic control points [37].

Table 1. SWOT of LRCP in the study area.

Strengths	Weakness
<i>Legal framework and land administration institutions established</i> <i>Decentralized powers</i> <i>Low cost and rapid registration process</i> <i>Participatory and pro-poor approach</i> <i>Cadastral land registration system</i> <i>Improved tenure security of landholders and initiated landholders to SLUP</i> <i>Improved women's land rights, access to land and wellbeing</i>	<i>Little attention to land use planning</i> <i>Weak linkages with other development organizations/ experts</i> <i>Some legal gaps</i>
Opportunities	Threats
<i>Cadastral land registration system for spatial planning</i> <i>Women's awareness of their land rights increased</i>	<i>Land shortage</i> <i>Some administrative problems and negative ideologies of the local people</i>

Decentralization of powers

The federal government decentralized the power of administration and land management and assigned the responsibility for natural resources to the regional authorities. Settings for land administration also have been extended to the lower levels by establishing kebele and sub-kebele land administration committees. Land Administration Committee (LAC) members are volunteer people elected to implement the land administration system in ANRS [11,33,37,38].

Low cost and rapid registration process

The Ethiopian first level land registration and certification process is one of the cheapest in Africa. The certificates were handed over to landholders for free in Amhara, 5 Birr (Birr (ETB) is the Ethiopian currency. Currently, 1 US dollar is equivalent to 53 ETB) in Oromia, and 2 Birr in Southern Nations, Nationalities, and Peoples Region (SNNPR). In all these regional states, photographs of landholder(s) have to be attached, costing about 2 to 4 Birr.

Generally, the process to certify landholding rights in Ethiopia was very cost-effective (about US \$ 3.5 per household or less than US \$1 per parcel). As a result, millions of households were registered within a few years [29]. The process of the first level had been set up relatively quickly, and it has already changed the land administration scenery, specifically in ANRS with great enthusiasm [19].

Participatory and pro-poor approach

The LRCP in the ANRS is implemented via the participation of the local people. The process is facilitated by local participation with the support of experts. The main actors in the adjudication process are members of the Land Administration Committee (LAC) at the lowest level of local governance. The members of LAC get training to undertake this endeavour, but they are not paid for their time. The LAC is democratically elected at public village meetings and has carried out certification largely in accordance with the law. Farmers have been provided with enough information to fully participate in the process. In addition, Shemaglewoch shengo, the customary land disputes arbitration committee, played a significant role in reducing conflicts. Shemaglewoch shengo is a bridge between the formal and customary (informal) system. Moreover, the representations of the poor in LAC as well as free and frequent public hearings supports the poor to defend their rights [19,37,39–41].

The LRCP also includes rural women as members of LAC. In the study area, LAC contains five to seven members, of which at least two members are female farmers. A key informant stated the participation of the local people and women in the LRC process in the study area as follows:

“Women have participated in the LRC process. At the establishment of the LRCP program, there was a LIFT project (NGO) that facilitate the LRCP in this district. Therefore, in the beginning, the community was introduced and initiated about the program, such as how it can be done, when it will start, and when the program will end, and so on. Then, leaflets (graphical descriptions) were prepared about the registration and certification process (2nd level registration). It showed what was expected from the community, the project, and the government. Then surveying and other related tasks are done. Generally, during all these processes, women participated”.

Cadastral land registration system

As discussed earlier, the first level of registration lacks the spatial aspects of the parcel. To solve this shortcoming, the second level registration mainly integrates the mapping of the parcels in a cadastre. All data are available in a digital format with the result of a countrywide modern land administration system supporting also spatial planning activities.

Improved tenure security of landholders and initiating them to SLUP

LRCP registering and certifying rural landholdings improved the tenure security of rural households [34]. The land registration and certification processes have a great implication in maintaining farmers’ tenure security, which in turn, contributes to the sustainable agricultural development of the country.

As land tenure security stimulates farmers for long-term investments, land certification has a substantial and positive impact on households’ decision to implement sustainable land use practices (SLUP), for instance, planting trees, constructing terraces, and applying compost on their parcels of land. This indicates sustainable agricultural system development which, in turn, improves the wellbeing of the community [34].

Improved women’s land rights, access to land and wellbeing

Women’s equal rights to property are constitutionalized in the country. The ANRS registered and certified the rural households’ land either jointly in the name of the husband and wife or as a single holder in the name of a male or female. For example, in Machakel woreda, 62% of the registered parcels were jointly registered, and 22% were registered in the name of a single woman [36]. Similarly, a study by [41] documented that 80% of the 15 million registered parcels are owned by women, either privately or jointly with their husbands.

LRCP significantly contributes to women’s land rights. The previous patrilineal land tenure systems in the study area have changed. Women’s land rights are guaranteed and protected by the law. As a result, women are currently holding land either jointly or individually. This greatly contributes to the improvement of women’s access to land and other natural resources.

LRCP is also very advantageous for female-headed households (FHHs). In the past, before LRCP, women were disadvantageous in the death of their spouse and divorce when it came to controlling and sharing the household land and other resources, as the land was controlled by the male. Nowadays, LRCP solves these problems since women have a landholding certificate. Therefore, after the death of her husband, the woman can control the household land and during divorce, women can share the household land since they have a landholding certificate [35,36].

Females’ inheritance rights have also improved after LRCP. The new legal framework supports women’s and girls’ inheritance land rights. In the past, most of the time, males had inherited their families’ land and other property. After the LRCP, this situation changed since women’s land rights are guaranteed and supported by the law so that women can inherit their families’ land. This makes women highly aware of their land rights and involved in agricultural activities. This is a very important step to change the previous discriminatory law for gender equality in access to and control over land and natural resources [35].

Ref. [35] give evidence that women's land titling reduces traditional gender division of labour. In the study area, e.g., women with land certificates had a significant role in tree planting activities. Women's land titling strengthens women's participation in decision-making concerning the use of natural resources in general and tree-planting practices in particular. Women's access to land enables women to use and control also other natural resources, e.g., to plant trees and vegetables.

Moreover, women's access to land rights and land certification has a positive impact on accessing formal credits and enhancing land rental market participation [36]. The gender disparities in parcel features (slopes, scatterings, and land use) are also reduced after the implementation of LRCP in the study area.

Generally, women's wellbeing increased after LRCP. The majority of women in the study area were satisfied with the LRCP, happy with their quality of life, and their income increased after LRCP [36].

3.1.2. Weakness of LRCP

Little attention to land use planning

Though impressive efforts are observed with regard to land tenure, there is no comprehensive land use policy at the national level. The current rural land administration and land use proclamation focus highly on the legal frameworks and processes of land administration. The proclamation is not addressing legal frameworks for other land-related issues. A legal framework about how to use the land is still missing [34].

Weak linkages with other development organizations/experts

To attain sustainable rural development, development organisations should work cooperatively. However, in the study area, land administration and land use offices/experts have weak linkages with other organisations, such as forestry, agriculture, and gender offices/experts [34].

Some legal gaps in implementing legal frameworks

However, the legal frameworks granted equal land rights to women, and there are some drawbacks during the interpretation and implementation of formal laws. For example, according to [41], the legal framework stated only "family members" can inherit the land. In the case of Ethiopian family law, family members are those who live permanently with the landholder by sharing the income of the same. However, in the culture of most rural areas, married women often move to and reside in their husband's residential areas. In this case, women can't inherit their original families' land. This has a negative impact on women's land rights and access to land.

Similarly, in the study area, one informant highlights this situation: the gaps and the inappropriate application of rules and regulations of land administration legislation is one factor for the unequal distribution of male-headed households (MHHs) and FHHs. The key informant states that after the fall of the Derg (the communistic) regime in 1991, the current government redistributed the rural land once. During that time, the local committees had a role to implement this program at a local level and during the distribution of land, FHHs were disadvantaged by getting smaller land sizes due to the inappropriate application of rules and regulations, as stated by the key informant:

"During land redistribution programs, there is no equal distribution of MHHs and FHHs. According to our country's case specifically our region, the land distribution was done once (in 1989 E.C). From the beginning of the land distribution program and still now, ANRS land administration and use proclamations (both the previous and the modified versions) approve that women should get the land first (gives priority to women). However, due to this rule, at the beginning of the distribution, the local committee gives small portions of land (either 2 or 3 timad—timad is the local measurement which is equivalent to 0.25 ha—to FHHs and then they remove them from the distribution processes. Practically, the distribution process is not fair and not done proportionally

since the proclamation does not indicate how many hectares of land women should get first. It does not concern land size equality, it just states only women should get first. Hence, FHHs hold a smaller land size than MHHs due to the wrong interpretation of the law and the existence of the legal gaps."

Another weakness of the LRCP are gaps in the legal frameworks in the registration of land under a polygamous union. This affects women in polygamous partnerships, especially in case of divorce or the death of a spouse. Polygamous marriage arrangements are not common in the ANRS, still, it is practiced in some regions of the country. According to a study by [41], Somali (29%), Benishangul-Gumuz (21%), Gambela (21%), Afar (19%), SNNPR (16%), and Oromiya (14%) regions were living in a polygamous marriage.

3.1.3. Opportunities of LRCP

Cadastral land registration system for spatial planning

The cadastral system including the mapping of parcels enables sustainable land use planning throughout the country and infrastructural development of the rural areas. In the study area, parcels of each rural household are registered, the boundaries are measured and mapped, the size of parcels is calculated, and land uses are classified. LRCP made remarkable progress in registering land titles, as well as in demarcating parcel boundaries. This is very important for the further development of spatial planning of the country [36].

Women's awareness of their land rights increased

The land registration and certification activities improve women's awareness of their land rights and their participation in social, economic, and political affairs. [35] documents that nowadays women are significantly more aware of their land rights than during previous periods. Land titling strengthens women's self-confidence concerning their land rights. As a result, the majority (92%) of the respondents improve their participation in socio-economic and political spheres after the LRCP [36].

Moreover, nowadays the traditional culture restricting women are slightly changed [36]. Key informants explained that the community is currently freeing itself from traditional taboos and restrictions. This situation is a key opportunity for LRCP to empower women and maintain gender equality in the country.

3.1.4. Threats of LRCP

Land shortage

The constitution of the country as well as the land administration and use proclamation guarantees free access to land for rural residents. For example, the federal rural land administration and use proclamation (No.456/2005) states that peasant farmers/pastoralists engaged in agriculture for a living shall be given rural land free of charge (Art 5 (1a)). Similarly, Art 5 (1b) documents that any citizen of the country, who is 18 years of age or above and who wants to engage in agriculture for a living, shall have the right to use rural land. Accordingly, the ANRS confirms these persons a right to rural landholding free of charge. The main way of holding land currently is via inheriting it from their family. Hence, the share becomes smaller and smaller. The average size of parcels in the study area is about one hectare. Due to the scarcity of land, the majority of youths in the study area are either landless or have small land sizes. The government land bank does not have enough land to distribute to landless individuals [36]. As a result, the majority of rural youths immigrate to towns to find a job.

In general, the land shortage is a major threat to the sustainable agricultural development of the country. For instance, the small size of the land is a major reason for not planting trees [34] and for food insecurity [36]. Similarly, [33] document that the small and fragmented holdings have the effect of diminishing production per person and per hectare. Although the LRCP improves the tenure security of rural households, it could not solve the land scarcity problem of rural society, especially for youths [33].

Some administrative problems and negative ideologies of the local people

As documented above, the current land tenure system and LRCP have a positive impact on women's land rights. Nevertheless, it is hindered by some administrative problems and by the negative attitude of local people and civil servants [35]. According to [35], unethical practices of officials of land authorities at the local level are significantly affecting women's access to land, and they undermine the trust in governmental authorities. Respondents report about some civil servants, who do not keep the working hours and who do not treat clients, especially women, respectfully. They are sticking to customary-patriarchist-law, do not implement legal norms thoughtfully and are potentially open for corruption. In addition, the traditional ideologies of the local people about women are also a major constraint on women's access to land in the study area.

Corruption is a threat disproportionately affecting women and their land use rights [35,36]. In addition, border conflicts are also mentioned as a major problem of some FHHs. Females' land is highly influenced and gets obstacles from the male neighbours and family members: males trespass female parcel borders, take females' land forcefully, and plant eucalyptus trees near females' parcels [35]. The following case from the focus group discussion is evidence that females' land is taken by males forcefully and women's life is getting in trouble.

"I have 5 timad of land, but my brother has taken all parcels of my land. I inherited it from my father. I accused him, but he does not volunteer to give me the land. Like Member (Local court) ordered him to go to the office, but he is not a volunteer and has not gone to the office. He badly hit me (injured seven times). I am very scared that he will kill me. There is no organisation to help women in this case. Due to this reason, I went to town and was living with my ex-husband. But last time, my ex-husband does not want to live with me and getting me out from the house. I stayed the night outside a home in the streets with my children. Due to this reason, my two children went to Addis Ababa (the capital city of Ethiopia) to find a job. I would like to accuse my brother to get my land, but not my husband since the land is registered by only his name. From the government side, there is no enforcement of the law. For example, if a man goes to jail, he will release after some time. Therefore, the government due attention to women's land rights and give guarantee to protect women's rights"

3.2. SDGs Achieved by the Implementation of the Rural LRCP

A key objective of this study is to assess the contribution of LRCP to achieving the SDGs. In the above section, the success factors, and constraints of LRCP in the study area are identified. This section shows the contribution of LRCP to the achievements of the SDGs. Table 2 summarizes the contribution of actions implemented by LRCP to specific SDGs, namely SDG 1 (end poverty), SDG 2 (end hunger), SDG 5 (gender equality), and SDG 15 (life on land).

3.2.1. SDG 1 (End Poverty)

Target 1.4 aims "to ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property" and target 1.b aims "to create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies".

Rural land is registered by the names of males and females, which increases women's access to land and natural resources. In addition, geospatial datasets are acquired and available. As a result, the two targets of SDG 1 are achieved by the implementation of LRCP in the study area.

Table 2. The description of the achieved SDGs and targets by the implementation of the rural LRCP in the study area.

Actions Implemented by LRCP	Achieved SDG	Achieved Target/s [21]
<ul style="list-style-type: none"> Rural land is registered in the name of males and females. Women's access to land and natural resources is increased. Geospatial data are developed. 	SDG 1 End poverty	<ul style="list-style-type: none"> # 1.4: ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property. # 1.b: Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies.
<ul style="list-style-type: none"> Women's access to land and natural resources is increased. Women's wellbeing is improved after LRCP. The rural household's tenure security and sustainable land use practices are increased after the implementation of rural LRCP. 	SDG 2 End hunger	<ul style="list-style-type: none"> # 2.3: double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land. # 2.4: ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.
<ul style="list-style-type: none"> Women's land rights are guaranteed by law. The discriminative customary land tenure systems and cultural taboos are slightly changed. Equal land holding rights of women and men are achieved. Gender differentiation/ division of labor is reduced. Gender discrepancies in access to land and infrastructures is reduced. 	SDG 5 Gender equality	<ul style="list-style-type: none"> # 5.1: end all forms of discrimination against all women and girls everywhere. # 5.a: undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws. # 5.c: adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels.
<ul style="list-style-type: none"> More sustainable land use practices after the implementation of LRCP. 	SDG 15 Life on land	<ul style="list-style-type: none"> # 15.3: combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.

3.2.2. SDG 2 (End Hunger)

Target 2.3 aims “to double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land” and target 2.4 aims “to ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding, and other disasters and that progressively improve land and soil quality”.

After the implementation of the rural LRCP, rural households' tenure security increased. According to the results of the study, the farmers make investments in the land to increase productivity and apply more sustainable land use practices. Therefore, LRCP contributes to SDG 2. Even though the food security of the households increased significantly, the shortage of land also limits the achievements of this SDG, as especially young people are forced to move to towns and cities in order to provide their income. There is a trend visible that because of the inheritance laws farms get subdivided and land becomes too small to support the nutrition of a family. These issues have to be addressed in the future as the rural population is still growing.

3.2.3. SDG 5 (Achieve Gender Equality)

Target 5.1 aims “to end all forms of discrimination against all women and girls everywhere”, target 5.a “to undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance, and natural resources, in accordance with national laws”, and target 5.c “to adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels”.

In the study area, after the implementation of LRCP, women’s land rights are guaranteed by law, the discriminative customary land tenure systems and cultural taboos are slightly changed, and equal landholding rights of women and men are achieved [36]. In addition, gender differentiation/division of labour is reduced and gender discrepancies in access to land and infrastructures largely disappeared. This documents that LRCP has also a great contribution to achieving gender equality (SDG 5).

3.2.4. SDG 15 (Life on Land)

Target 15.3 aims “to combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world”.

After LRCP landholders feel tenure secured and engaged in more sustainable land use practices, such as tree planting, terracing, and composting [34]. This contributes to reducing desertification, restoring degraded land, and protecting against flooding and drought. In addition, the availability of geodata will support proper land use planning activities as well as enable effective flood controlling and disaster management. In this way, LRCP contributes significantly to the achievement of SDG 15.

4. Discussion

Land and resource rights are central to many sustainability-oriented strategies that have been emerging in the past several decades [42]. Land is the key to achieving SDGs in Sub-Saharan Africa as most SDGs are based on land performance indicators [24]. Hence, Ethiopia has implemented one of the world’s most cost-effective land registration and certification systems to document then landholdings of rural households [43].

Local people, including women, were involved in the implementation process of the LRCP, as stated for instance by [41]. [41] also documents that one of the distinct features of the second-level registration and certification process is its emphasis on women’s participation during the implementation of the program. Women are involved in different practices, such as awareness-raising activities, demarcation and survey work, public notification, certificate collection, and subsequent transactions.

LRCP improves the tenure security of rural households. [44] gives evidence that the low-cost land certification program contributed to increasing the tenure security of rural households and reducing land disputes. Rural land rights and tenure security are important for achieving especially SDG 1 (end poverty), SDG 2 (end hunger), and SDG 5 (gender equality) [45,46]. Similarly, [47] states that land tenure security is at the heart of many of the SDGs. Land tenure security is explicitly referenced in Goal 1 (no poverty), target 1.4; Goal 2 (zero hunger), target 2.3; and Goal 5 (gender equality), target 5.A.1 and target 5.A.2. As a result, land tenure security has come to the forefront of the sustainable development agenda in recent years [42].

Generally, land administration and land management activities contribute significantly to the achievement of the 2030 Global Agenda [48]. This study confirms that the LRCP highly contributes to addressing the UN SDGs, such as SDG 1 (no poverty), target 1.4 and target 1.b; SDG 2 (zero hunger), target 2.3 and target 2.4; SDG 5 (gender equality), target 5.1, target 5.a, and target 5.c; and SDG 15 (life on land), target 15.3.

4.1. The Contribution of LRCP to the Reduction of Poverty (SDG 1) and Hunger (SDG 2)

Over the past few years, the issues of access to land and land rights received much attention from development organizations. This is caused by recent global trends that are threatening poor people's access to land and other natural resources. Facing hunger in many countries around the world, especially in rural areas, where many of the poorest and most vulnerable groups are relying on land and natural resources for their livelihoods, issues of land access, land tenure systems, and tenure governance have become essential issues to reduce hunger and poverty [49].

In Ethiopia, agriculture dominates the country's economy, contributing to 37% of the GDP. Smallholder farmers contribute 85 % to agricultural production [49]. Therefore, land rights and proper land use management practices are prerequisites for the reduction of poverty and hunger since agriculture is the dominant sector of the country. LRCP contributes to tenure security, improved credit access, and improved access to land and other natural resources, which in turn, contribute to reducing poverty and hunger.

Moreover, women's access to land rights and land certification has a positive impact on accessing formal credits [36,50,51] and enhancing land rental market participation [36,52–54] which, in turn, contribute to reducing poverty and hunger. In addition, the landholding size of FHHs increased after the LRCP [36]. Women's land titling and certification are also important for accessing other natural resources, such as trees and their products [35]. This has a positive effect on the improvement of their livelihood.

Similarly, land registration systems in Kenya enable sustainable development by improving land tenure security, access to credit, real estate transactions, land use planning, land development, taxation, and dispute resolution among others [55].

Therefore, given persisting hunger in many countries around the world, especially in rural areas, where many of the poorest rely on land and natural resources for their livelihoods, issues of land tenure rights have become basic tools to reduce hunger and poverty [49].

Generally, improving land tenure security or the equality of property rights is recognized as an enabling condition for improving food security. Food security is so intimately tied to land tenure security. People have always depended on the land for basic needs as well as materials and services [47].

4.2. The Contribution of LRCP to Achieving SDG 5 (Gender Equality)

The promotion of women's land rights is increasingly seen as an important means to trigger development outcomes, e.g., poverty reduction, and increased resilience to the effects of climate change. Securing gender-equal land rights is a significant part of global efforts aimed at achieving gender-equal opportunities and outcomes. Hence, strengthening women's tenure security has broader societal and economic effects [56].

Advancing women's land rights is a priority agenda in the SDGs. As documented in SDG 1, equal rights in ownership and control over land, as well as equal rights to the inheritance of productive resources (target 1.4) is required to end poverty. The SDGs also imply that to achieve gender equality and to empower all women and girls (SDG 5), policies and legal reforms are needed to give women equal rights and access to ownership and control over land and other economic resources (target 5a). Therefore, women's access to land is an important pathway for achieving the strategies of poverty reduction and gender equality [28].

This study confirms that LRCP highly contributes to SDG 5. Land reform programs have better outcomes for gender equality. For example, land reform programs in developing countries including registration and certification enhance gender equality by strengthening women's land rights and access to land [35,36,52,53,57,58], and reduce gender disparities in access to social infrastructures [36].

LRCP has a great implication in the improvements of women's land rights and the breaking up of the previous traditional customary tenure system of the country, which restricts women to access land. Hence, the inclusion of legal rights for women is a distinctive

feature of LRCP of Ethiopia. Sometimes the legal frameworks also contain affirmative provisions and procedures for the protection of land rights of women [19,39,41].

Studies confirm that women's access to land improves women's livelihood. For instance, it improves women's welfare [59], reduces their vulnerability to poverty [60], improves food security [61], and empowers them [62]. Therefore, women's land rights and tenure security are important tools to achieve economic development and reduce poverty [63].

As a result, in recent years, the Ethiopian government has committed itself to gender equality in various laws and policies. Women's equal land rights is among the major concerns of Ethiopian land administration issues [35,36,41,64]. Hence, improving the tenure security of women and strengthening women's rights to access land through land registration and title certification is the major objective of the LRCP of the country [11,65].

The current study found an improvement in the legal frameworks of women's land rights and structures of the land administration system in ANRS after LRCP. In addition, the investigation verified an essential contribution of the land registration and certification process to women's land tenure security, reduction of gender disparities in access to land and other resources, changing the patriarchal land tenure system of the country and improving access to land and gender equality in general.

4.3. LRCP for Achieving SDG 15 (Life on Land)

The majority of the community involves in sustainable land management practices after certifying and registering their land [34]. Therefore, LRCP contributes to SDG 15, target 15.3. Similarly, a study by [44] documents that a low-cost land certification has a positive impact on the maintenance of soil conservation structures, investment in trees, and land productivity. In general, the Ethiopian government's action to increase tenure security and transferability of land rights can significantly enhance rural investment and productivity [66].

5. Summary and Conclusions

The LRCP is a recent practice in Ethiopia to protect the land tenure rights of rural societies. The improvement of tenure security and rural households' livelihood situations are the major goals of LRCP. The current study found that LRCP, in addition to a positive impact on rural society, is a remarkable contribution to the achievement of SDGs. It strengthens the tenure security of rural societies, improves sustainable land management practices as well as secures women's land rights.

In the study area, the improvement of women's land rights was verified by an increase in women's access to land and their wellbeing. Gender disparities in access to land were reduced, and women's participation in social, economic, and political spheres increased. Hence gender equality in access to land is successfully implemented in the study area.

This study documents that LRCP is a key pathway for improving women's land rights and eradicating discriminatory customary land tenure systems. Therefore, women's land rights should be a primary aim of land policy in developing countries. Maintaining tenure security and equal land rights for women is a prerequisite for the sustainable development of the country and for addressing the objectives of gender equality.

Although LRCP contributes demonstrably to the achievements of SDGs, LRCP is hampered by corruption and some administrative processes. The Ethiopian government should draw attention to solving these obstacles. This is necessary for the successful implementation of the LRCP and, thus, the achievement of the SDGs.

In general, the Ethiopian rural LRCP has great implications for the tenure security of rural households, gender equality in access to land, sustainable land use practices, and the wellbeing of rural households. Hence, the LRCP is a key factor for the achievement of SDGs in developing countries since their livelihood is highly reliant on agriculture. Hence, other developing countries can learn from the implication of the Ethiopian LRCP. They can start with the registration of land rights of rural households to fight poverty and improve gender equality.

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