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Study of Socio-economic Drivers and community perceptions on Invasive Alien Plant *Prosopis juliflora* in Northern Tanzania

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ABSTRACT

Prosopis juliflora (P. juliflora) is an invasive plant introduced in Tanzania for restoration and greening the degraded sites. Since its introduction in Tanzania, there has been no assessment about its associated socio-economic drivers and community perceptions in those areas of introduction. In this study, we generated information on socio-economic drivers and community perceptions on this invasive alien plant in Northern Tanzania. We employed multistage stratified random sampling technique for obtaining the sites for data collection within the effective study area. We used Focus group discussion (FDG) to collect data on social economic drivers and community perception on P. juliflora. The results indicate that, community had variation on knowledge about P. juliflora. However, its presences in block A, D, E, F, G and H are driven by the need of shade tree and fuel wood. Community perceive that it is causing effect like displacement of other plants, injuries to both human and domestic animals especially to those blocks (D, E, F and G) with its high density. Together with those effects, communities perceive not to eradicate P. juliflora in their environment unless there will be a substitute species with comparable characteristics and providing similar services obtained from it. In conclusion, the economic and social services obtained from P. juliflora are the major drivers of it to be embraced in the invaded area and majority of communities has decided to live with it in Northern Tanzania. We recommend quick awareness creation to the communities in those invaded areas is inevitable.

Key Words: Drivers, Perceptions, *P . juliflora.*

INTRODUCTION

Prosopis juliflora (P. juliflora) is an evergreen tree native species to South America and the Caribbean [1] . The species is characterized by having spines and have high root growth rate which elongates 40 cm in approximately 56 days from the germination date [2]. *P. juliflora* thrives well in low-laying areas at altitudes between 300 meters (m) above sea level (a.s.l) to 1900 m a.s.l with high water tables and areas along rivers streams and floodplains, it likes to tap water from underground aquifers hence proliferating in areas with a high water table [3]. The species adapts to a wide range of soil, sand, saline soils and poor fertility soils due to its ability of nitrogen fixation for its use[3].

The spread of *P. juliflora* from its native countries came on when the seeds were transferred and introduced to other countries purposely for a specific need. This has been observed in India where *P. juliflora* was introduced them in arid

and semi-arid Tamthe il Nadu region to cater for the shortage of fuel wood [4]. n Ethiopia, the species was introduind1980s to minimize desertification in arid and semi-arid areas with intense grazing activities in Eastern Africa [5], while in South Africa it was introduced basically for shade and fodder during the drought spell [6]. In Kenya, the species was first introduced in the Mombasa region at Bamburi to rehabilitate the quarry mines in the1970's and during 1the 980's ware reintroduced in Baringo County to overcome the scarcity of fuel wood and to cover the overgrazed land [7]. The major means of spreading from introduction areas to other areas within the country of introduction can be through water dispersal when the pods with seedlings are taken by floods from one area to another, this can be a reason most *Prosopis juliflora* is colonizing along the riverbanks or ephemeral watercourses. Livestock are effectively spreading *Prosopis juliflora* when they feed on pods, the seeds are deposited fecal already broken dormancy as the pericarp of the seed is pealed in the digestion system, thus when the animal moves dropping they spread the seeds in all way they move [8].

In Tanzania Prosopis species are believed to be imported by the transboundary traders' donkeys ate Prosopis pods from Kenya dropping their dung in the Mwanga district [9]. Also in 1971 *P. juliflora* was introduced for restoration purposes and greening of the degraded sites in the Mombo ward at Korogwe district, Morogoro and Dodoma [9]. In other areas which are potential for Prosopis growth the spread is believed to be by movement of animals especially in range lands [9].

Since its introduction in Tanzania, there has been no systematic assessment of the invasion status of *P. juliflora* and associated socio-economic drivers in its potential preferential areas in many parts of the country, especially in Northern Tanzania where the species is said to have its first introduction. The study [9] done on the species has focused on managing patchy areas that have been identified to harbor the population of the species, including lower Moshi (Kahe) areas, Kilimanjaro. South American Prosopis species were introduced to some areas in Tanzania for restoration trials in the 1970s with invasive ranges and their success is notably undocumented to date compared to those other tree species introduced for research in forestry. The inadequacy and or lack of the community perceptions information may contribute to limited and ineffective approaches towards the control and other management strategies in Northern Tanzania. This study generated information on socio-economic drivers and community perceptions of the invasive alien plant *P.juliflora* in Northern Tanzania. This information contributes to planning effective management strategies for the containment of *P. juliflora* spread.

2. METHODS

The study was conducted in the Northern zone of Tanzania in the area that lies between latitudes 3°12' and 5°12' South and longitude $35^0$36'and 38°24' East in Kilimanjaro, Arusha and Manyara regions. The altitude of the area ranges between 500 to 1900 m a.s.l and receives 450 mm to 700 mm of rainfall annually. The land use in this area involves General land and village land (Communal land and private land and vacant land) (Fig. 1).

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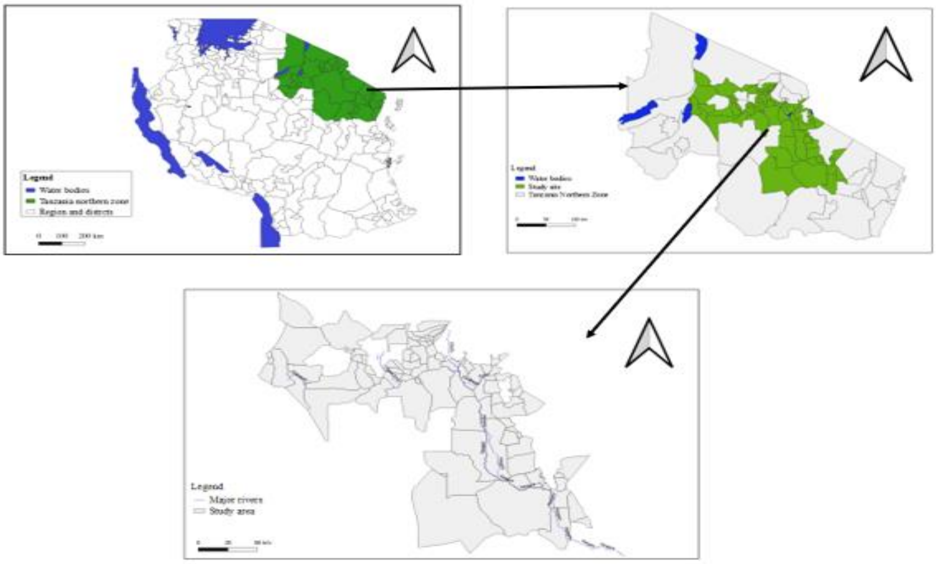

Figure 1: Map showing the location of the study area in Northern Tanzania

2.1 Study design and sampling strategy

The study employed a multistage stratified random sampling technique for selecting the area for data collection within the effective study area. The map of the effective study area was used to segment the study area into 8 blocks by using the Northern zone major rivers flow direction from its source (North to south) as a base for demarcating each block. Lines of demarcation were aligned using the longitude along the river. The fact of river floods being one spreader of *P. juliflora* from invaded areas to other floodplain areas [7], has provided bases for using the major rivers to demarcate the blocks of the study area on the map. The blocks were marked A, B, C, D, E, F, G and H on the map (Fig.2). Within each block of the study area we divided the area into 100km^2 grids which enabled us to determine the sampling percentage of the area to be visited in each block to find out the invaded areas. Therefore, The number of grids to represent the blocks for data collection was then calculated by using the modified formula proposed by [10] whereby 8% sampling intensity was used to ensure proportionate of the sample grids in each block concerning the size of the block (Eq. 1). The number of grids for each block was as presented on Table 1 below. We opted to use the random sampling technique to ensure sufficient coverage of the study area and increase the chance of finding its distribution in different areas with different community attitudes.

$$\text{Number of grids} = \frac{\text{Area of the block (km}^2\text{)} * \text{sampling intensity}}{\text{Area of the grid (km}^2\text{)}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

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Table 1: Study area block and number of grids sampled from each block

Block	Major River	No. of grids	No. of the grid at 8% sampling intensity
A	Simba - Makuyuni	123	11
B	Makuyuni – Ngaramtoni	114	7
C	Ngaramtoni - Nduruma	21	1
D	Nduruma – Usa	20	2
E	Usa – Kikafu	162	13
F	Kikafu – Rau	152	10
G	Rau - Woona	215	27
H	Woona –Tanzania-Kenya border	312	20
Total Grids		**1119**	**91**

Areconnaissance survey was done in each block to familiarize with the study area topography, terrain, and ground truth of the areas invaded by *P. juliflora* and mark them on the study area map (Fig. 2) and the type and attitude of the communities in invaded areas. The information generated from the reconnaissance survey was used to guide us in deciding the techniques to be used for data collection and sampling strategy and where to collect data. From the reconnaissance survey in each block, *P. juliflora* was found in blocks A, D, E, F, G and H (Fig. 2). The general information about *P. juliflora* was collected in all blocks while the specific information for socioeconomic drivers and perceptions were collected in the invaded blocks excluding uninvaded block B and C.

We decided to employ Focus group discussion (FDG) to gather information on social economic drivers and community perception of *P. juliflora.* The participants from each block were selected based on the number of years of living in a particular area within the block. The living period proposed for this study was not less than 10 years. The period proposed was observed suitable for the community member to understand well their environment and be able to provide precise information about any environmental change within more than 10 years. The number of participants varied between the blocks ranging from 5 to 25, depending on their willingness to participate (Table 2). The discussion was guided by checklist questions focusing on social economic drivers and community perceptions on the invasion of *P. juliflora* into their environments.

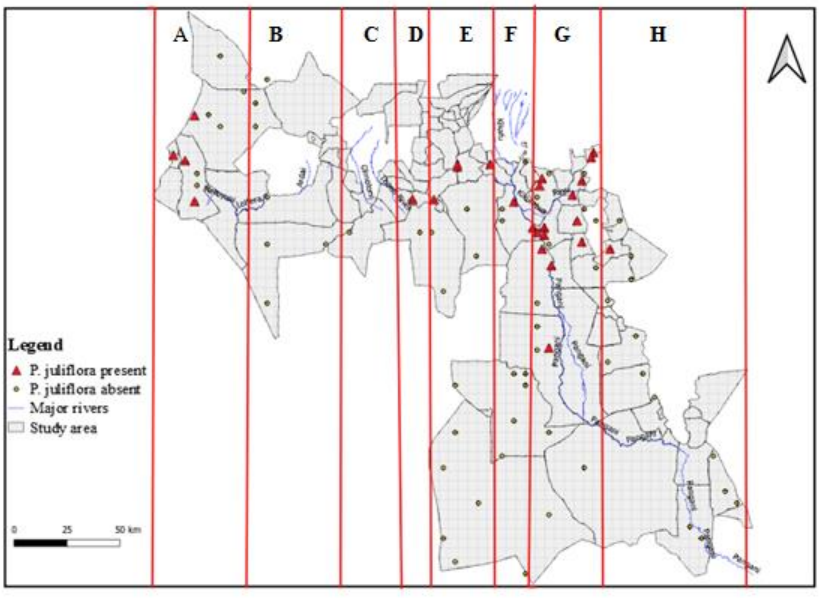

Figure 2: Map showing the presence and absence of *P. juliflora* in the surveyed grids in Northern Tanzania

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Table 2: Focus group discussion participants in surveyed grids

Block	Location	No. of participants
A	Esilalei ward & Mto wa mbu wards	12
B	Lolkisale ward	5
C	Moita ward	5
D	Mbuguni ward	10
E	Rundugai ward	12
F	Msitu wa Tembo ward and Nyumba ya Mungu	15
G	Lang'ata and Mwanga wards	22
H	Kwakoa ward	11

3. RESULTS

General community demography

The interviewed community members (65% male and 35% female) had a moderate level of education whereby 53% had primary school education, 38% had secondary education and of them, 9% had gone to post-secondary education. In most of the communities in the study area, 49% were agro-pastoral societies and only 4% were found employed while others were 11% businessmen, 12% were crop cultivators only and11% were pure pastoralists (Table 5).

Table 3: Statistics of community characteristics in Northern Tanzania

Variable	Category	Frequency (N=92)	Percentage
Gender	Male	60	65
	Female	32	35
Age	11-20	4	4
	21-30	14	15
	31-40	30	33
	41-50	22	24
	51-70	22	24
Level of education	Primary School	49	53
	Secondary school	35	38
	Post-secondary school	8	9
Livelihood strategy	Crop cultivators	11	12
	Pastoralist	10	11
	Business	10	11
	Employed	4	4
	Agro-pastoral	45	49
	Fishing	12	13

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Community knowledge on *P. juliflora* in Northern Tanzania

The community knowledge was examined in each block by assessing the ability of the community to identify *P. juliflora's* perception of the period(year) when it was introduced, the place/land where it was introduced, method of introduction and spread from the introduction place to other areas. The results were as follows: -

i. Ability and knowledge of identifying *P. juliflora.*

Based on FDG results, the overall results indicated that community members (N=92) involved in the study showed a variation in the ability to identify *P. juliflora* 5% of the community members involved in the study had great knowledge while 38 % had fair knowledge, 20% had little knowledge and 37% did not know features may be used to identifying *P. juliflora* from other Prosopis species (Fig. 3). On the other hand, concerning the number of members involved in the FDG in each block, the analysis on each block indicates that block A, B, C, E, G and H had a higher percentage of individuals 92%, 100%, 100%, 25%, 4% and 82% respectively who did not know the identification of *P. juliflora*. The members with great knowledge of identifying *P. juliflora* were in blocks F 27% and G 9% while the other block had no members who scored points satisfying this category. Furthermore, 40%, 25%, 71% and 78% from blocks D, E, F and G were graded in the fair knowledge category as seen in Table 3 and illustrated in Figure 4. The community members in block Band C were not able to identify it as they have not seen *P. juliflora* in their areas.

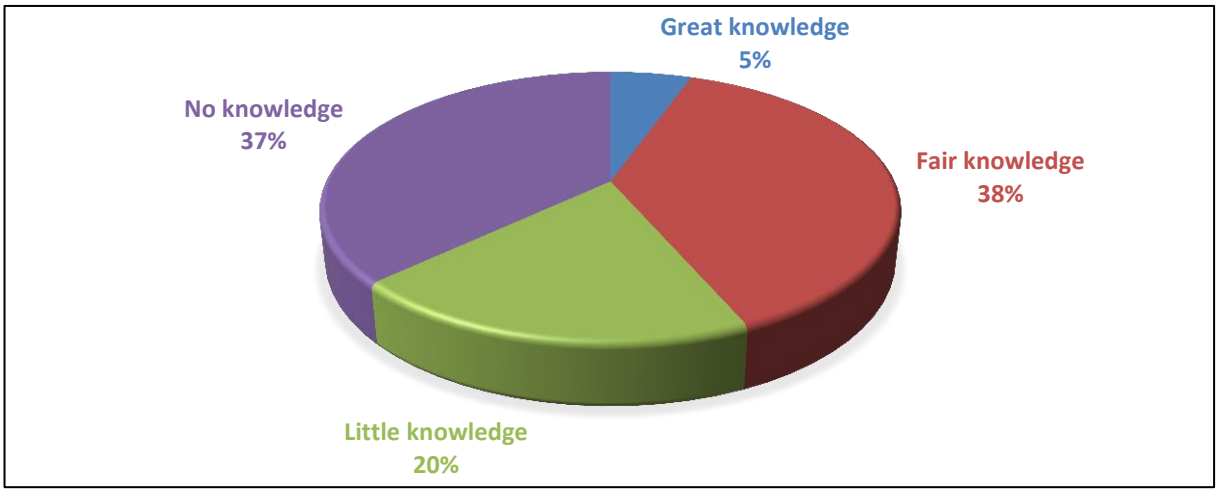

Figure 3: There are overall ranks of knowledge of key features for identifying *P. juliflora* in the study area.

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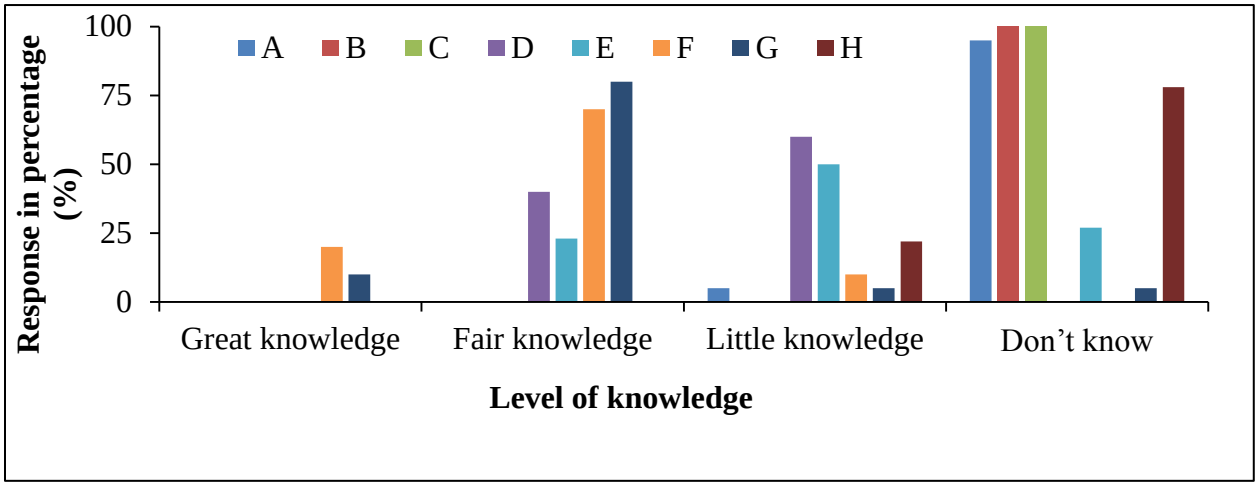

Figure 4: Community knowledge level per block on *P. juliflora* identification

ii. Knowledge of introduction year

During FGD in each block members were given a chance to mention the year in which *P. juliflora* was introduced to their environments. The mentioned years were grouped into 5 groups (below 5 years ago, 5-10 years ago, 11-15 years ago, 16-20 years ago and more than 20 years ago) concerning several years from the mentioned year to the date of the discussion. In this, the pair-wise ranking score table technique was used to generate scores for each year group by tallying the number of members who agreed to it. The results indicated that 23%, 60%, 58%, 23% and 85% of the mentioned years in blocks A, D, E, G and H respectively, indicated that *P. juliflora* was introduced to their land below 5 years ago from the date of the discussion. Also, 8%, 40%, and 18% of the community members in blocks A, F and G said it was introduced between 11-15 years ago. Furthermore, the results showed that in blocks A, F, and G there was 25%, 7%, and 5% scored years respectively indicating that *P. juliflora* was introduced in a period of more than 20 years ago (Fig. 5).

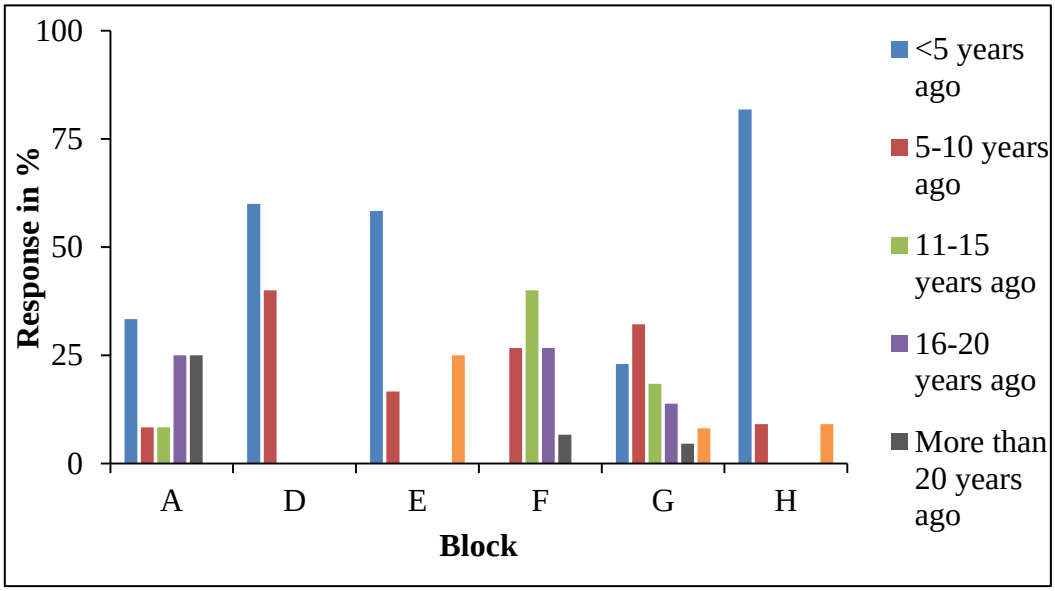

Figure 5: Community perceptions on the period of introduction of *P. juliflora* in their land areas.

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iii. Method of introduction

The overall results from FGD 82 members involved in the study indicate that purposive planting scored 80% of the member's views on the method of introduction while the concept of growing by itself scored only 1%. The concept of being introduced by animals scored 15% and the other 4% were not aware of how *P. juliflora* was introduced in Northern Tanzania (Fig.6)

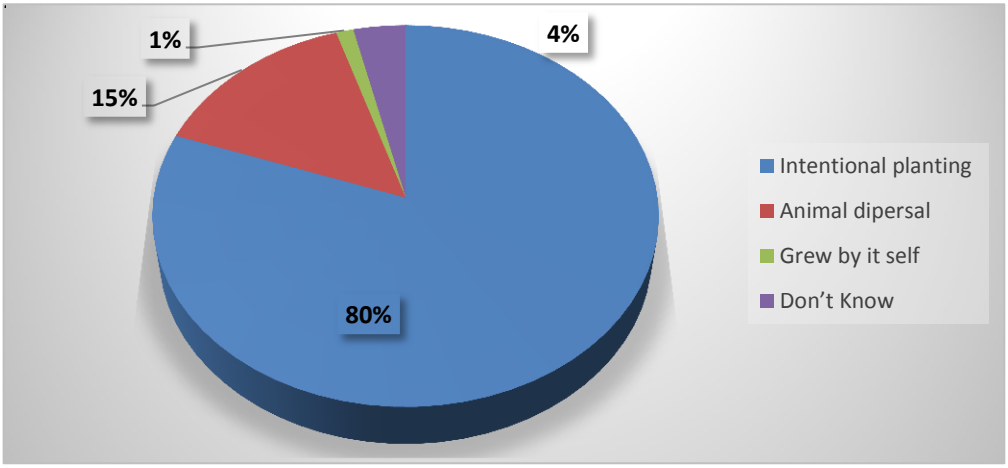

Figure 6: The overall perception of the community on the methods introduced *by P. juliflora* in Northern Tanzania

However, the results from each block showed that the highest frequency method mentioned in all blocks found with *P. juliflora* indicated that it was first intentionally planted in those areas (Fig.7). The second mentioned method was through animal dispersal, for which 20%, 5%, 30% and 17% of the group members in block D, E, F and G respectively claimed it was brought to them by animals. Other methods are as in Figure 7 below.

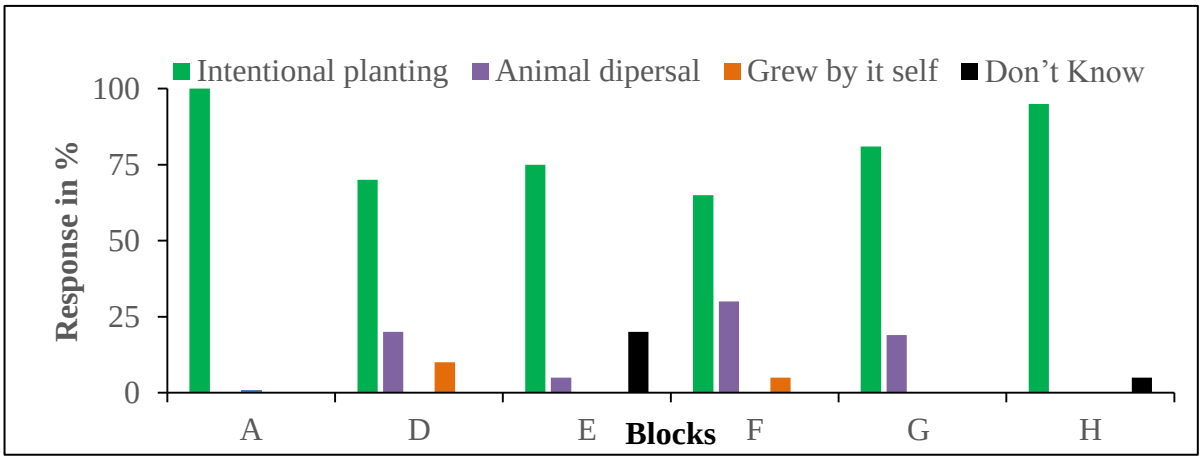

Figure 7: Ways/Methods on which *P. juliflora* was introduced in different areas in Northern Tanzania

iv. Place/land of introduction

Being introduced purposely in most of the areas in each block, *P. juliflora* was also mentioned to be introduced largely in private land. The result indicates that in all blocks where *P. juliflora* was found, at large was first introduced on private land. In blocks, A and H, 100% of the members involved in the study responded that it was introduced on private land. Likewise, in blocks D, E, F and G, 70%, 55%, 80% and 76% of the respondents correspondingly

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confirmed *P. juliflora* was first introduced on private land while the rest said it was introduced on communal land. Those in block Band C had no idea where it was introduced as there was no *P. juliflora* tree observed in their land (Fig. 8).

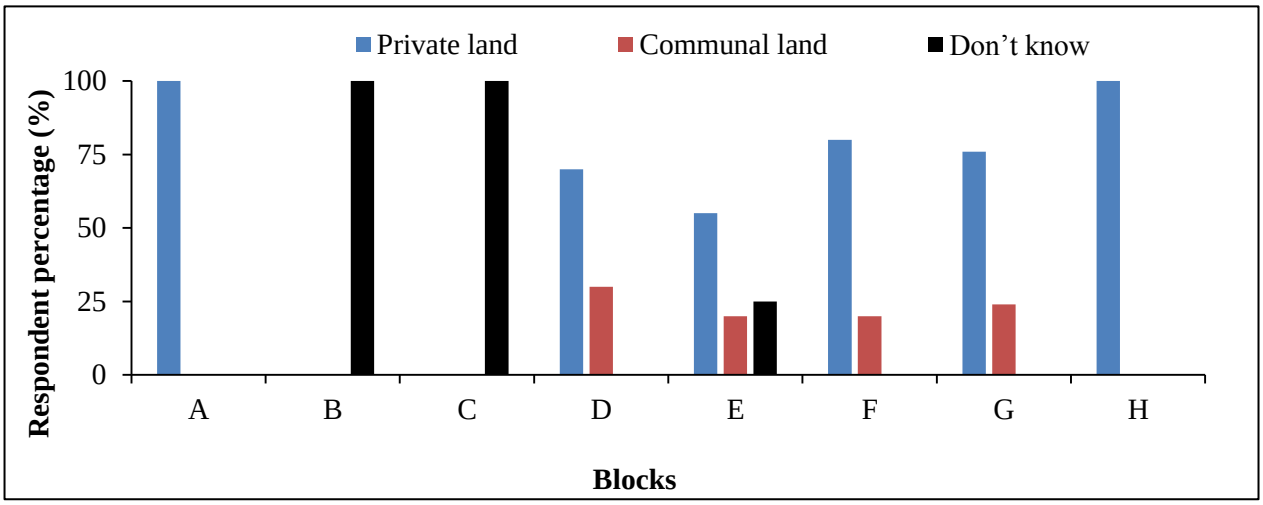

Figure 8: Respondent perceptions on the area where *P. juliflora* was introduced

Perception of communities on various impacts of *P. juliflora*

The results depict that in blocks A and H where there was thornless *P. juliflora*, the communities had not experienced any effect posed by the presence of *P. juliflora.* In blocks B and D no effect as there was no any *P. juliflora* observed in those areas. In blocks D and E, the most serious mentioned effect was the puncturing of motorcycles and vehicle tires and injuries to both humans and animals while in blocks F and G the most mentioned effect was human injuries and injuries to both humans and animals respectively (Fig. 9).

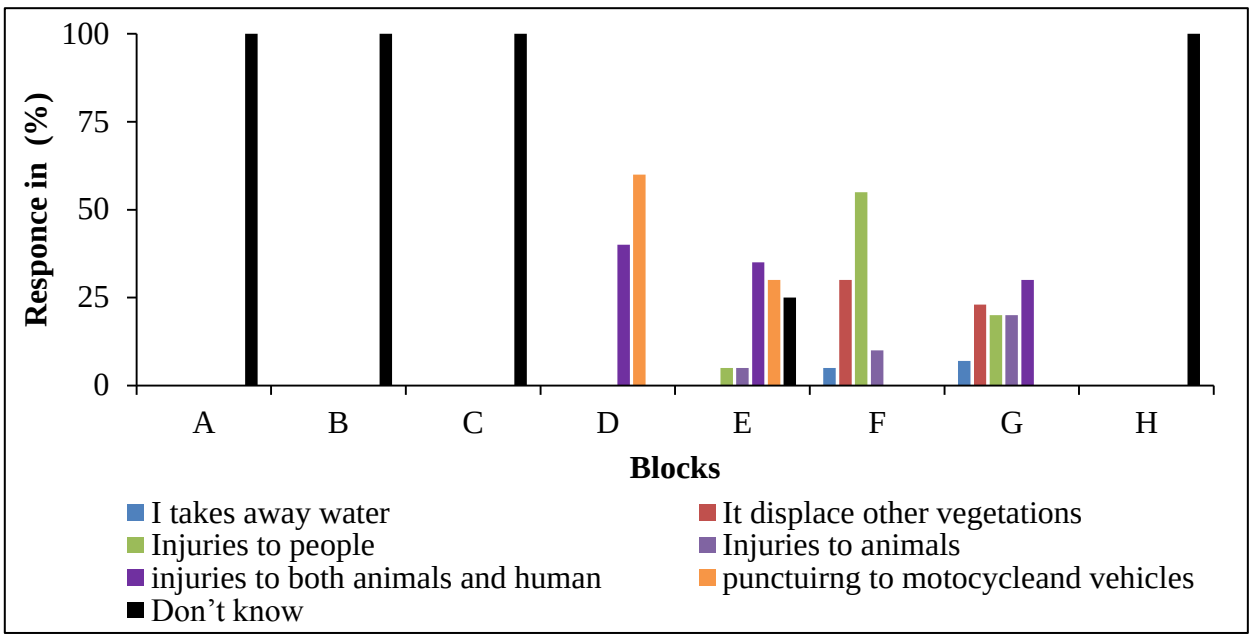

Figure 9: Respondents' perceptions on effects caused by *P. juliflora*

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Drivers of the introduction of *P. juliflora*

Drivers of the introduction of *P. juliflora* in each block were assessed and were grouped into two major groups of ecological and socio-economic drivers. Ecological drivers included the need of restoring degraded areas, greening of bare lands, and sheds in homesteads while socio-economic factors involved the need for fuel wood (charcoal and firewood), land marking, fencing and fodder for animals. The results revealed that ecological drivers were the major drivers forcing the communities to plant *P. juliflora* in their areas. Block A, D, E, F, G and H had a higher percentage of respondents who commented on ecological drivers compared to socio-economic drivers as seen in Figure 21. Respondent in block B and C did not know their drivers since there was no observed *P. juliflora* trees in their land areas.

Drivers of *P. juliflora* in the Northern zone

According to the results from the FGD in the study area, *P. juliflora* has been used as a shade tree in all blocks surveyed. In blocks A, D, E, F and H the respondent percentage of 80%, 60%, 40% 50% and 95% respectively said *P. juliflora* is mostly used as a shade tree in their private lands. In block G, it was different from other blocks, most of the respondents 70% argued that *P. juliflora* is used as firewood. The response for other uses is as in Figure 10 below.

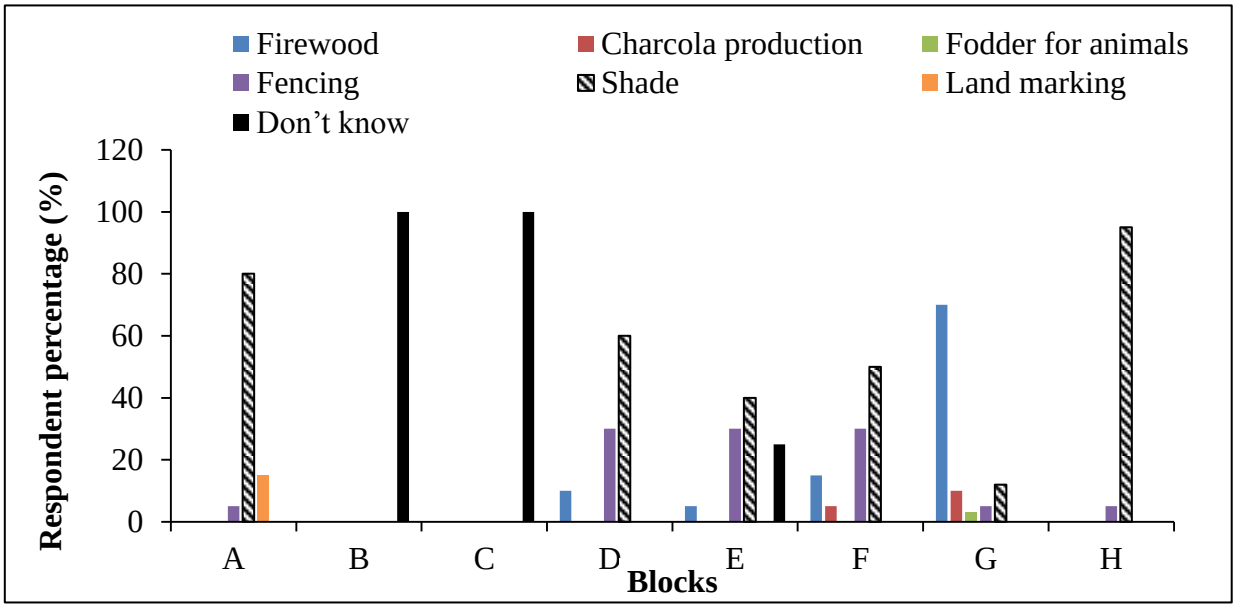

Figure 10: Uses of *P. juliflora* in Northern Tanzania

Perception on eradication of *P. juliflora*

The perceptions on eradication were assessed in only invaded blocks. The five-level Likert scale dependent variables

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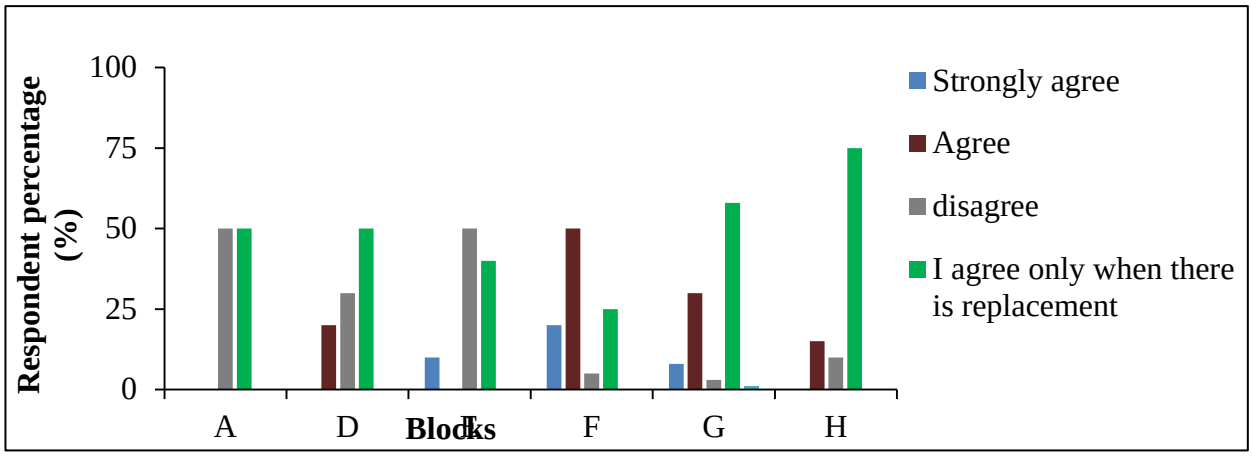

Figure 11: Respondent perceptions on eradication of *P. juliflora*

were used to measure the acceptance of the community to eradicate *P. juliflora and* were grouped into 5 categories (i.e., strongly agreed, agreed, agree only when there will be a substitute species, disagree, and strongly disagree). In block A, there was an equal percentage of 50% of response scores who disagreed and those who agreed with the condition of the introduction of substitute tree species which will provide equivalent services as those obtained from *P. juliflora.* In block D, 50% of the scores shows they agreed but conditioning introduction of substitute species, in block E 50% of the members disagree with the concept of eradication of *P. juliflora* while 40% agreed with similar conditions provided in block A and D. In block F, 50% of the answers mentioned showed they agreed with no any condition while in block G and H, 58% and 75% of the optioned topic respectively was agreed with similar conditions as those in block A, D and E (Fig. 11).

DISCUSSION

The living strategy of the community in the surveyed study area in Northern Tanzania

From the results the majority of communities in the surveyed study area in Northern Tanzania are agro pastorals, the area has arable land dominated by smallholder farmers, climatic conditions (temperature and precipitation) and soil fertility supports crop cultivation activities maize is the major cultivated crop. Also, the area supports pastoralists as it has a semiarid climate with plenty of range areas suitable for both grazers and browsers animals.

Community knowledge of *Prosopis juliflora*

Concerning the variables placed to determine the community knowledge of *P. juliflora*, the results indicated that, there was variation in knowledge of identifying *P. juliflora* among the community members in the study area. The identification differed concerning the location and its history of introduction and the physical appearance of the available *P. juliflora.* Communities living in block A in the Monduli district dominated by thornless *P. juliflora* had low knowledge of identifying this specie, most of the elders in this area were not aware of its name as it was observed as a new tree species to them and it had no a local name until children decided to name it after its sweet test pods as ***"Mti mua***" meaning tree with sweet fruits. The knowledge of its variation in physical structure was also a paradox to them as they have never seen it having a different structure, especially with long stiff sharp thorns. In block other blocks where they are dominated with thorn *P. juliflora,* i.e., blocks E, F and G in invaded ward in Moshi, Mwanga,

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Rombo, and Simanjiro districts the communities named the tree after the origin of the first person who introduced it in Kenya side. *P. juliflora* is believed to be introduced in Kenya around areas bordering Tanzania by a Russian investor who introduced it for restoration purposes[3]. On its entrance to Tanzania, the tree was new to most of the community members, and it had no local name they decided to name it ***Mrashia*** name after the known origin of the Kenyan investor. The dominant *Prosopis juliflora* variety with thorns they call ***Male Mrashia*** and the few thornless are called ***Female Mrashia***.

On the knowledge of the period of introduction, the general view of the results indicates that community members perceive that it was introduced around 15 years ago in Northern Tanzania. Detailed to specific block areas, in blocks D, E and H, at Mbuguni ward in Meru district, at Sanya Stesheni ward in Hai and Kwakoa ward in Mwanga district respectively showed it was introduced in the period of 5 years. In blocks A, F, and G at Mto wa Mbu ward in Monduli district, at Msitu wa Tembo ward in Simanjiro district and Mwanga ward in Mwanga district respectively it showed to be introduced around 20 years ago and this was verified by a retired forest officer who evidences that *P. juliflora* was introduced at Mwanga, Monduli and Simanjiro districts by government enrichment planting initiatives projects for greening the observe bare lands Northern Tanzania. This was also evidenced by the presence of the said to be the oldest *P. juliflora* trees in those areas (Plate 2).

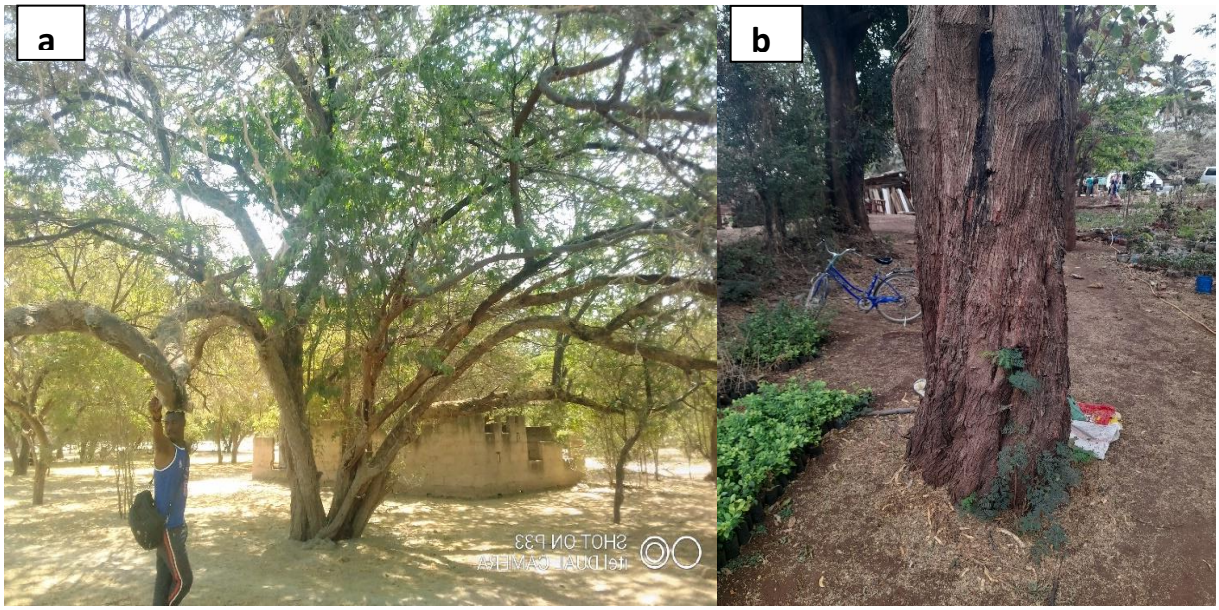

Plate 1: The oldest P. juliflora trees were found at (a) Msitu wa Tembo ward and (b) at Mto wa Mbu ward roadside nursery in blocks A and F respectively

Furthermore, community knowledge on how it was introduced was also examined, where was first introduced in terms of land ownership and drivers of introduction to particular areas. In general, it showed that *P. juliflora* was intentionally planted to save different services in observed invaded areas in Northern Tanzania. It showed it was introduced largely in private land, especially in settlement areas. The main driver for the introduction of *P. juliflora* in those areas was to save services like shade, fencing and fuel wood services. The purposive introduction driven by similar needs was also reported in studies conducted in Kenya and Ethiopia by [7], [10], respectively.

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Plate 2: *P. juliflora* trees used for fencing and shade in different areas in Northern Tanzania

The purposive introduction of *P. juliflora is* evidenced by the observed patch distribution in the study areas. Also, the observed presence of a high density of *P. juliflora* in private land compared to communal land and likewise the presence of more sub adult and adult trees in private land than in communal land is indicating that it was intentionally introduced as the land owner is entitled to plant and keep any plant of his or her interest and not permitted in shared land like communal land. In the current period, there is the continuation of intentional planting of *P. juliflora* in areas with low plant vegetation cover in other areas like in Ngarasero ward in Ngorongoro district from which they obtain seedlings from the road nursery tree nursery at Mto wa Mbu ward. The tree planting initiatives in those areas are facilitated by conservation Non-governmental Organizations (N.G. O`s). Also, it was observed at Nyumba ya Mungu and Ngage ward in Simanjiro district in block G communities are planting trees for fencing and shading purposes claiming that it is the only specie that has shown good growth performance and resistance to the present harsh plant growth environment compared to other preferred shade trees like *Terminalia species*, *Azedarachta indica* and Senna species. The trial study done in England has proved that *P. juliflora* can be used as stock proof live fence [10].

Plate 3: Well nursed *P. juliflora* trees planted at Ngage village in Lobo Siret ward in Simanjiro district in Northern Tanzania.

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In addition, it was also observed that there was introduction through animal dispersal. The dispersal of *P. juliflora* seed was mostly mentioned in Block D, E, F and G in Meru, Hai, Simanjiro and Mwanga districts. Livestocks like goats, sheep and donkeys are effectively spreading *Prosopis juliflora* when they feed on pods, the seeds are deposited in fecal already broken dormancy as the pericarp of the seed is pealed in the digestion system [11]. At Kivulini village in Mwanga district in block G, community members use goat fecal as a source of viable *P. juliflora* seeds, when they want to plant it for fencing they just make strip canal around the intended area and spread the goat and donkey fecal in it and cover with the soil. After five to six days *P. juliflora* emerges all along the canal. It has been observed as a simple way of planting than doing scarification for breaking the *P. juliflora* seed dormancy. Animal dispersal has also been observed by [7] in his study on the spread of *P. juliflora* in Lake Baringo Kenya. The initial report of the *P. juliflora* invasion in Tanzania indicates that it was introduced by cross-border traders with their donkeys crossing from Kenya to Tanzania via the Mwanga district [9].

Community Perception on Effects of *P. juliflora*

Prosopis juliflora has been reputed to pose many side effects to both environment and community functioning and structure. The *P. juliflora* has been a threat to public health in Mali as it was suspected to accommodate malaria vector mosquitoes [12]. This study in Northern Tanzania has identified different experiences on the effects posed by *P. juliflora.* The experience differs with the type of *P. juliflora* present in a particular area. The communities in block A in Monduli district were not aware of any effect of *P. juliflora* as the area is dominated by thornless *P. juliflora.* In places dominated by thorns *P. juliflora* had experienced the effects and the most mentioned effect was the injuries to both humans and animals. During a discussion with the community members in blocks E and G in Hai district and Mwanga district, it was reported that *P. juliflora* thorns led to leg amputation to one of the villagers and also it causes a wound to animal skin, hooves and damage to animal eyes leading to blindness [4].[13] unveiled that the neurotoxicity of *P. juliflora* leaves and pods have posed damages to the central nervous system of animals like cows and goats when fed as a sole feed. According to communities in block G in areas around Moshi DC in Kahe ward where it was observed to be with higher abundance and density, it has caused the communities to change their living strategies from crop cultivation to charcoal making to stabilize their household income as *P. juliflora* has invaded their cropland and becoming difficult and expensive to control its spread. Also, it has been claimed to displace other vegetation causing a monoculture tree stand, this has impacted the previous diversity of ecosystem services obtained from that environment. and led to the disappearance of some bird species, this scenario has also been reported in India by [14]. In this study, it has been noted that the density of *P. juliflora* is directly proportional to the series of problems noticed by the communities in invaded areas. Also, the type of *P. juliflora* variety influences the community's perception of the effects posed by it.

Eradication of *P. juliflora*

Eradicating or not to eradicate *P. juliflora* has been debated among communities due to its conflict of interests regarding its costs and benefits [15]. Based on the results from the focus group discussion in this study, the discussion on the question of deciding whether eradicate or not was guided by the majority of the communities that leaned on the side of the perceived benefits and were not willing to eradicate *P. juliflora* until they obtain substitute specie which will have comparable growth characteristic and ecological services. Together with the observed factors which

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influence this decision, the areas observed to be invaded historically were almost bare land with very low vegetation cover due to poor soil fertility and prolonged soil erosion, *P. juliflora* has been their choice specie due to its ability to thrive in stressful environments. Most of the community members in these invaded areas are agro pastorals, they opted to use *P. juliflora* for fencing their livestock compounds and marking of their preoccupied land when they shift to other areas. Environmental factors observed in the study areas have made communities depend on *P. juliflora* as an economical and easy ameliorator. It's fast growth and resprouting character also influenced communities to depend on it for fueling wood [16].

CONCLUSION

The social survey showed that *P. juliflora* in Northern Tanzania has been purposely introduced for around 20 years and the major drivers for introduction were the need for shade trees and restoration of degraded areas and this reason is still escalating the planting of *P. juliflora.* Though *P. juliflora* is claimed to pose healthy injuries to both humans and animals in different areas in Northern Tanzania, communities have decided to live with it benefiting its fast-growing character compared to other tree species for shading, fencing and restoration as in most areas where it was introduced was bare land with low vegetation cover and low soil fertility.

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