



THE CHOICE TO STAY: THE STUDENTS' PERCEPTIONS OF LIFE IN SITIO RONGGOT, CALAMBA CITY, LAGUNA, PHILIPPINES

Charisse O. Tolentino-Evangelio^{1,2*}, Dorathy A. Gecolea³,
and Johanna Marie C. Ramos³

¹University of the Philippines Los Banos

²University of Perpetual Help System Laguna

³University of Perpetual Help System DALTA Calamba

*Corresponding author: revangelio@yahoo.com

ABSTRACT – *Sitio Ronggot* is prone to floods and typhoon attributed to its geographical location. Thus, it is necessary to implement relocation projects to areas identified as high risk. The study embarked on exploring the reasons behind the apparent attachment of families who stayed in the *Sitio Ronggot* even with the provision of fully furnished houses in a safer relocation site and the different perceptions it created among students who belong to the families who stayed. An interview was conducted among selected students who still reside in the area. Themes were derived from their narratives. Results highlighted the participants own description and images of the *Sitio*. Subthemes also emerged: difficult place, epitome of provincial life, a place or rich social connection, place that encourages a serious outlook in life, a place of personal historical significance, place of happiness, and people and place relationships. It was concluded that the decision was rooted in the connection of the community to the land and its relevance to their economic and social lives. It is recommended that any interventions to be implemented in the area should include a consideration of the relationship of the people to their land.

Keywords: climate change and social dynamics, communities and lakes, lived experiences, sense of place, shared meanings, perception of youth

INTRODUCTION

Bonds to place, which results from understanding, emotional connection, developing meaning for a particular place and features of a place, is known as place attachment and meaning (Shumaker and Taylor, 1983). This, together with function of space for groups, space, and territory, were the focus of place and people relation researches for the past 25 years (Altman and Low, 1992). Related to this, the concept of sense of place and its relation to identity, and social attachments has been an area explored in different researches (Hashemnezhad, Heidari, Hoseini, 2013).

The relationship between man, his image, and environmental characteristics refers to sense of place. Various association of a place was rooted from people's subjective experience (traditions, cultures, society and history) and the environment's external influences (landscape, sound, smell) (Hashemnezhad, Heidari, Hoseini, 2013). For Qazimi (2014), "*Place attachment is a part of place identity but place identity is more than attachment*" (p. 307). The idea was also supported by the statement of Low (1992) when she related place attachment to place identity and defined the link between people and various places and the bond's effects in pace-making, identity development, practice and perception which

defines the concept of place attachment. It was since 1970's when the phrase "place-identity" has been used. With regards to the environment, place identity is composed of observation and interpretation. Proshansky et al. (1983) stated that "*place identity is developed by thinking and talking about places through a process of distancing which allows for reflection and appreciation of places*". Tuan (1977) states that there is a strong link between person and environment if taken based on mental, emotional, and cognitive.

In the Philippines, these concepts could be seen in studies of indigenous groups and their relationship to their land. Molintas (2004) stated that the land defines the indigenous people's existence. The deity has created the land and everything that is connected to it as based on the Philippine origin myths. It was not subject to sale, lease, purchase or ownership as it is sacred. The interactions of their ancestors with the land were based on production of food and thus the land was viewed as part of their community.

In the City of Calamba, in the Province of Laguna, Philippines, lies a secluded area known as *Sitio Ronggot*. The place has been a subject of community outreach programs and social immersion activities of nearby colleges, universities, and local NGOs. The area's terrain makes it susceptible to annual flooding and is prone to effects of storm deluge. Thus, a relocation site was created by the Canossa sisters to help remove the people of *Ronggot* from potential environmental risks. Despite this, most of its residents refuse to leave the area even when they are offered a free relocation site with complete amenities and better proximity to the local trading areas. Their refusal to leave the area also means that their children have to travel a very long distance to attend highschool and collegiate classes.

Thus, this study set out to 1) explore the students' perceptions about their life in *Sitio Ronggot*; 2) determine the images of *Sitio Ronggot* to the students; and 3) describe how these perceptions and images were formed.

MATERIALS AND METHODS

Sitio Ronggot is considered as the remotest of the seven sitios/purok of *barangay* Lecheria (Figure 2). This little known area has been considered as one of the few remote areas in the developing town of Calamba. According to *Barangay* Lecheria's Health Worker's office, the small community is composed of eighty households with three hundred families living along the side of Laguna de Bay.



Figure 1. Location of Calamba City, Laguna from Manila, Philippines (Source : Google Maps)



Figure 2. Location of Ronggot marked by Ronggot Multi-Grade Elementary School (Source: Google Maps).

In this study, the researchers conducted interviews, observation, and kept journals in gathering data. This study has three (3) participants. The participants were students living in *Sitio Ronggot* who have been residents of the area for ten (10) years and who are within ages 18 to 24. Ten (10) years is the minimum years of residency required since the experiences that the participants already have accumulated would be enough for them to develop a certain connection to their land.

Open-ended questions were drafted by the researcher to elicit responses that would answer the specific problem of the study. Before the interview was conducted, the participants first signed a confidentiality agreement and were interviewed only if allowed by their parents. They were also fully informed of the purpose of the study. Researchers/interviewers also probed further through follow-up questions, whenever necessary, in order to give participants a chance to open up and express themselves more. Interviews were long and intensive.

The researchers also went to the *Sitio* for five non-consecutive days to observe the participants in their natural setting and to experience firsthand the life in the area. The researchers also used journals to record their experiences in the *Sitio*.

Lecheria's Barangay Captain allowed the data gathering in the sitio. He even offered their local barangay's help and assistance for the researchers to accomplish their study. He also oriented the researchers about what to expect in the area. He said that life in *Ronggot* is really far from what the people in the city is used to. The researchers also conducted initial site inspection with the guidance of the Barangay Peace and Security Officer (BPSO) Chief. The travel took 20 minutes before the researchers reached the area. Although rough roads still exist in the *Sitio*, there were parts of the road that were already concrete which significantly reduced the travel time of the researchers. Farms are located alongside the road. Houses were built using light materials such as plywood and bamboo sticks. There were also a few stone-walled houses. The locals received the researchers warmly.

The researchers structured a timeline for their visits and immersions in the area. As part of the immersion, the researchers also performed the livelihood tasks of the locals and attended whatever

gatherings that took place during their visit. The researchers made a thorough observation of the participants and their situation in order to understand the meaning of their setting in *Sitio Ronggot*.

Analysis of data was done after transcribing the interviews. The researchers used thematic analysis by Braun and Clarke as their guide in coding and building themes and in unearthing meanings. The researcher used thematic analysis to the data gathered from the participants during the interview process. The method of thematic analysis is used to identify, analyze and report patterns (theme) within a data. In the study, the researchers paid attention to the production, identification and analysis of themes from the data gathered.

RESULTS AND DISCUSSION

Sitio Ronggot is a small community, located at the far side of Calamba’s barangay Lecheria. Apart from this, it is hardly accessible by vehicles. Thus, it’s quite daunting for visitors who would visit the area. It will take half an hour for outsiders to reach the *Sitio*. Visitors would need to pass through the narrow five-kilometer rough road. One can reach the *Sitio* by renting a tricycle for one hundred fifty pesos. On rainy days, they have to deal with its wet and muddy street.

The main source of income and food for the locals includes selling of swamp cabbages, fishing and poultry businesses. The locals are known as *Magkakangkong* since gathering *kangkong* has been a part of their everyday work in the community. When it comes to education, they have Ronggot Elementary School. However, it only has one instructional room that holds grade one to grade six classes. Students who want to pursue high school and college level would need to seek other educational institutions outside the *Sitio*.

Compared to this observable sketch of the *Sitio*, the narratives of the participants presented a different dimension of *Sitio Ronggot*. This encapsulates the themes and subthemes that emerged (Table 1).

Table 1. Derived themes and subthemes.

Themes	Description of <i>Sitio Ronggot</i>	Images of <i>Sitio Ronggot</i>
Subthemes	A difficult place	A place of personal historical significance
	Epitome of provincial life	A place of happiness
	A place or rich social connection	People and place relationships.
	Place that encourages a serious outlook in life	

Dimensions of Sitio Ronggot

Jorgensen (2001) specified three dimensions of place namely: cognitive, behavioral, and emotional dimensions. This illustrates the link between the human-to-human and human-to-environment interactions that presents their perceptions of a place. Based on these concepts, the participants’ descriptions of *Sitio Ronggot* are could also be seen in the same context.

Descriptions of Sitio Ronggot

Descriptions of *Sitio Ronggot* focused on the participants' perception of the place's form based on their belief of the place characteristics. These themes are both a discussed in terms of the *Sitio*'s physical environment and the social environment

A difficult place. The difficulty, mentioned by all of the participants, refers to the many environmental challenges they experienced because of the area's topography and its inherent risks. *Sitio Ronggot* is at the shores of *Laguna Lake* which in itself entails the risk of flood water making its way to the resident's houses' doorsteps. This is an annual phenomenon in the area. Normally, the only path leading to the *Sitio* is submerged in rain and lake water during the rainy season. If the water does subside, it leaves a muddy path which would be difficult for vehicles to traverse. The participants further share '*...malayo sa city mahirap bumyahe, kailangan ng service* (far from the main highway of the city, and difficult to reach though public transportation, you have to have your own means to get here) and '*lyon, malayo yung school, naglalakad lalo na kapag naulan kasi putik yung daan* (it's far from the school, when it rains, you have to walk because the road is muddy).

Still, the people of the *Sitio* have already adapted to the conditions in the area. Each of the houses has boats for maneuvering flooded streets. They also built their houses a few feet higher from the ground based on the estimated rise of water level. Also, some houses have their own manually operated water pumps inside their own homes in case water supply is disrupted due to floods or typhoons.

The *Sitio*, is very far from the main highway. This alone makes mobility a challenge for its residents. It takes approximately an hour on foot to reach the area. There is no public transportation in the area. Most of its residents instead own a motorcycle or tricycle. This is a source of daily struggle for college and highschool students living in the *sitio*. Since the school in the area is meant for elementary students, they are forced to seek education outside of the *Sitio*. Thus, before their parents deliver their produce to the main market and return to their farms, they first bring their children to school. This prompts these students to rise very early in the morning. After school, they also have to wait for their parents to finish their farming activities before they are picked up by them.

An epitome of provincial life .As one of the participants stated, '*Simpleng lugar lang, nasa probinsya ka* (This [Ronggot] is a simple place, just like living in a province),' *Sitio Ronggot* embodies the typical idyllic quality of provincial life. This life is characterized by the physical characteristics and the atmosphere induced by these physical characteristics. Since *Sitio Ronggot* is devoid of modern infrastructures and has limited number of vehicles in the area, its exposure to pollutants is very minimum. Trees, plants, vegetable gardens, and water cabbage farms occupy the areas, only disrupted by a few houses lining up the shores of the *Sitio*. Cool air in the afternoons and colder breeze during evening and early mornings are common in the area.

As previously mentioned, accessibility is an issue in the area. The participants associate this problem with provincial settings. Their concept of provincial setting focuses more on the infrastructure issues and hampered development coupled with a more natural setting. The setting of typical provincial areas is also associated with everything that is fresh. There is a close interaction between the physical environment and the people living there. Thus, for them, the isolation of the *Sitio* also connotes a specific charm for the place. This makes the *Sitio* peaceful and comfortable especially during weekends. It becomes a place of repose after the daily grind in school and work. The *Sitio* is described as 'peaceful' as no criminal or deviant acts that occur. Even rowdy behavior is self-regulated as people in the area value tranquility and it has become part of the community's norm.

The lifestyle of provincial living is also characterized as non-dependence on technology. There is a high physical experience as most chores and activities are done manually. Some homes even do not have refrigerators and are content with buying and cooking food on the same day since most of them go to the city market daily to sell their produce. People here also grow their own vegetables and raise chickens.

This kind of physical environment also influences the behavior of the youth. Because of its location and lack of basic safety infrastructure, the students are compelled to maintain a normative curfew. The environment also discourages disruptive behavior among its residents. Even when students do go out with friends outside of the *Sitio*, they always go back before evening. There's no specific curfew policy being implemented in the area but because there are no street lamps, they have decided by themselves the time that they should be back in the *Sitio*.

Place of rich social connection. Being isolated also means people have formed a strong support network, mostly shaped by their daily interactions with each other. The small number of residents provides more opportunities to have face to face conversations and sharing of daily experiences through sharing of daily activities. This regular connection building activity promotes close ties, almost familial in nature. They are close and everyone in the community knows everyone. They bond as a community in shared tasks during town fiestas or an event that will be held there. Open communication is nurtured in the community. They are all encouraged to share whatever difficulty they encounter. Thus, problems that one of the residents encounter could lead to a collective analysis of the problem and collective suggestion to address the problem, as illustrated by a participant, '*gawa po kapag kunwari may event na ganyan, gagawin mag-titipon tipon po kapag may problema para pong nag-kakaisa talaga* (In an event, we would gather as a community and talk about problems that arise. We are really united).'

The participants' idea of unity is based on how they see people handle community activities and how they decide as a community. Being small in number, group discussions could easily be done in the area. Aside from this, the length of their stay contributes to their familiarity and sensitivity to both the needs and behavior of community members in relation to what is happening in their environment.

A place that encourages a serious outlook in life. The isolation of the *Sitio* eliminates any form of distraction, except the chosen pastime activities of its residents. It also draws people to focus on what the community does to sustain itself and the daily routine of farming and fishing activities. This also provides a clear view of the realities existing in the *Sitio* : dwindling number of residents, slow disappearance of the land's sand and soil, and the possible future of the *sitio*. This was reflected by one of the participants shared, '*yung ma tao dito parang seryoso sa buhay kais panay trabaho lang ang inaataupag, walang gulo* (People here are serious in life because all they do is work, no ruckus).'

Thus, most of the adult residents are seen by the participants as exhibiting a serious outlook in their lives. There is a strong sense of responsibility for one's life and the lives of their families. All activities done in the community stem from the goal of being a productive member of the *Sitio*. Rowdy activities do not occur as these are not given a priority and are collectively discouraged. This is something that could be seen as possibly embedded in the community's core values. These values and outlook in life are also embodied by the student participants wherein they focused more on their studies as stated by a participant, '*simple lang gawa ng dito lang, tawag dito, yung mga bagay lang na ano, yung gagawin ko talagang ano, halos puro pinag-kakaabalahan din kasi yung ano ko dito yung pinakaginagawa ko puro talaga kasi ako sa pag-aaral* (We have a simple life here. All we do here are productive things, for me, I am more focused on studying).'

Images of Sitio Ronggot

A place of personal historical significance. *Sitio Ronggot* is a significant place for the participants due to two reasons, their parents met there and they, themselves, were born there. Most of the participants in the area were born and raised in *Ronggot*. This made the *Sitio* their place of origin. Places of origin carries with it strong affinity between the people raised there and the place. The place becomes the source of belongingness where people can identify themselves as part of the place. Also, it connotes a sense of oneself as their first understanding of life and the beginnings of their memories all lie in one place. The symbols that comprise the culture and core values of the community of the *Sitio* is also accepted and respected by the students. They also believe that living in the *Sitio* has already become a part of their habit, and although it serves as a distinct contrast to the world outside of the *Sitio*, it is still a place which they will feel more of themselves as illustrated in the response of the participant, '*...dito na rin ako lumaki, dito ako pinanganak tapos na ano ahm, andito na yung mga tito ko, nanay, tas mga pinsan ko yun,...*(...I was born and raised here. My uncles, my mother, my cousins are also here...).'

All of them shared that their parents were also born and raised in *Ronggot*. Being already born into the ways and norms of the area, it has become part of their way of life and thus, even with the existence of an alternative place to live, they decided to settle there as well. Families formed in the *Sitio* also led to the formation of clans through extended family. Economic activities and historical milestones of the area are also kept strong within the family. Thus, the decision of staying in *Ronggot* became a family matter. This is mostly because the skill that their parents have is already anchored on either fishing or farming. No other available means are possible for them since they were unable to go to College.

Place of happiness. The students view *Sitio Ronggot* as a happy place. They all recalled fond memories of their childhood and regular reunions and gatherings of their families. This, they emphasized, as one of the reasons why they would always go back to *Ronggot* even if they'd have a house somewhere else. They believe that it is a place where they could relive the memories of the past and still interact with the people of the past. The past, for the participants, is not a chunk of a timeline but a full life lived in a specific area that carries its own narratives, emotions, and social dynamics. It physically ends once a person leaves the place but will constantly be lived simultaneously and regarded as life *outside of Ronggot* instead of *life after Ronggot*.

Shamai (1991) stated that attachment to a place begets a strong emotional relationship with a place. The place has unique characteristics (place of close family ties) and character (openness and conduciveness) to the people who inhabit the area. Emotions created by the social interactions as well as communication of shared meanings (memories) made *Sitio Ronggot* synonymous to the participants' idea of happiness, '*kahit na may bahay na ko, kahit na mag-kakaroon ako ng bahay doon syempre babalik parin ako dito* (Even if I already have a house somewhere else, I will still return here).'

People and Place Relationship

The Residents as cultivators of the land. The residents of the *Sitio* are mainly engaged in farming and fishing wherein they are one of the major suppliers of water cabbages in Calamba City, Laguna. Their daily routine is dominated by hours spent in the water cabbage farms. They normally wake up very early in the morning, at around 2 in the morning, in order to bring their produce to the main Market of the City known as Trade center. Here, they sell them by sack or by bulk. After this, they buy whatever they need for the day in the same market before they go back to the *Sitio* to pick up their

children and bring them to school. The remaining hours are spent cultivating and harvesting the cabbages as one of the participants shared: ‘... *sina mama at si papa yung nangangangkong tapos ayun mula umaga yun hanagang hapon, ay tanghali, umaga hanggang tanghali* (...my mother and father, they plant water cabbages from morning up to late afternoon).’

The participants understood the value of the farm and how it shapes interpretation of time and division of activities in their daily lives. The morning is marked by produce exchange in the market, while afternoons are marked by fulfilled duties in the farm. They adjust to the demands of the farm if they fail to follow the specific time frame that they have established in their daily routine. If they are unable to come home on the designated time, before nine (9) in the morning, they sacrifice their rest time to compensate for lost hour or minutes.

The cultivation activity of the residents goes beyond the economic benefits it brings to the residents. It also creates an ‘identification’ of the place. As previously mentioned, the area is a known plantation of *kangkong*. The residents themselves put a premium on their produce as best quality since these were meticulously planted, secured, and nurtured. Thus the water cabbage could be perceived as the product born out of the intimate interaction of the residents and the environment of *Sitio Ronggot*.

Residents as a component of the place. Based on the participants’ statements, they see themselves beyond just residents of the place. As a participant shared: ‘*kasi po naging parte na po sya ng buhay ko kaya babalik-balikan ko pa din, dito na po kasi nangyari yung mga ano experience na, na pwede kong mga memories na* (It [*Sitio Ronggot*] has already become part of my life. I would keep on coming back here. I experienced a lot of things here; these are already part of my memories).’

The participants view the place as an extension of themselves. *Sitio Ronggot* is place wherein they can identify with. It could not be separated from their lives and their lives could not be entirely separated from what defines *Ronggot* as a place. The place already reflects a part of their identity not influenced by the institutions outside of the *Sitio*. This relationship is an intimacy brought by length of stay and emotional relationships created during their developing years.

Creating the place: Sitio Ronggot

Canter (1977) defined form, function, and meaning as the three creating elements of a place. Form refers to the symbolic physical state the place takes in the consciousness of the people. Function is the utilization of the place as perceived by the people. Meaning is the product of emotional connections a place has with the people.

The student’s view of the physical state of the *Sitio* are born out of their experiences mostly based on environmental textures, sensations, and conflicts brought about by the innate elements of a place near a body of water and far from the town proper. The *Ronggot’s* form is characterized by three key concepts which the students used in their responses: distance, flood, and the state of positive isolation. Both flood and distance are associated with a negative impression of the terrain of *Sitio* since it manifests on the challenge that they, themselves, experience in crossing and living in the area. These descriptions could also be similar to an outsider’s perception of the area. The strongest concept that could come from actual residents of the *Sitio* is *positive isolation*. They see that the isolation of the place is not to be viewed as a fault but as a characteristic that make the area unique and appealing to them. It becomes a state that is livable. Being isolated meant more serenity, a space conducive for living. The conditions for isolation to be positive are also met by a satisfactory experience of the participants. One of which is serenity being a constant element of the area.

On the other hand, the function of *Sitio Ronggot* for the participants is more of economic provisions. They understood that the means through which they were able to attend school and finish studying up to the Collegiate level is because of their parents' income from selling *kangkong* (water cabbage). They also believe that the term that could be associated with the place is *kangkong*.

Meaning is formed through the participants' interactions with family, community, and with oneself. There's more reference of the past that they shared with the place and how the place influenced their habits, views in life, and their sense of community. The time they spent in the area makes them more tolerant of whatever physical challenges living in the *Sitio Ronggot* would bring. To them, the family and memories formed in the area outweighs the difficulties of living in the said *Sitio*.

CONCLUSION AND RECOMMENDATIONS

The study explored the different images of *Ronggot* based on the participants' perceptions. Through the social interactions and relationship they built within and with the place, they saw *Ronggot's* terrain as a challenge faced in daily dynamics of life. Life in *Sitio Ronggot* is simple, their basic needs are met and they have a source of income.

They perceived the *Sitio* as an important part of their lineage and legacy. The place formed their identity and associations because of the exchange of symbols and meanings within the community. This constitutes part of the memories they associate with the place. This, together with what the economic activities that they do, is what keeps them from leaving the *Sitio*. Their rootedness and the value that they place on water cabbage farming allow them to see living in *Sitio Ronggot* as enough.

This people and place relationship influence a community's decision to migrate even at the light of possible risks posed by a certain area. The losses that relocation entails are equated with uprooting. The social implications outweigh the apparent security of relocation, prompting the community to favor resiliency and adaptation.

Thus, in addressing the risks in the *Sitio*, the social capital of the people in *Ronggot* should be considered. Interventions should be sensitive to the relationship of the people to their land. Projects for the *Sitio* could be accepted if human-place relationships are considered.

ACKNOWLEDGEMENT

The Authors would like to thank Barangay Captain Patiga, Barangay Peace and Security Officer (BPSO) Chief, Dominino Endozo, and the whole community of Sitio Ronggot for the support they extended during the conduct of the study.

STATEMENT OF AUTHORSHIP

D.A. Gecolea and J.C. Ramos gathered primary and secondary data and transcribed the interviews; C Toletino- Evangelio also gathered secondary data, processed the data, performed the analysis, and drafted the manuscript. All authors discussed the results and commented on the manuscript.

REFERENCES

- Altman, I. and Low, S. (1992) Place attachment, *Human behavior and environments: Advances in theory and research* .vol 12, Plenum Press, New York.
- Cross, J.E. (2001) *What is sense of Place, Research on Place and Space*, retrieved Sept 10, 2017
- Hashemnezhad, H., Heidari, A.A., Hoseini, P.H. (2013) Sense of Place and Place Attachment, A Comparative study. *International Journal of Architecture and Urban Development*, vol 3, no.1
- Hummon, D.M. (1992) *Community attachment: Local Sentiments and Sense of place*. Plenum, New York.
- Jorgensen, B. & Stedman, R. (2001) Sense of place as an attachment: Lakeshore owners' attitudes toward their properties. *Journal of Environmental Psychology*, 21,233-248 doi 10/1006/jevp2001.0226
- Layder, D. (1993) *New Strategies in Social Research*, Cambridge: Polity –Mesch, G. and Manor O. (1998). Social ties, environmental perceptions, and local attachment. *Environment and Behavior*, 30, 504-519
- Mesch, G. and Manor O. (1998) Social ties, environmental perceptions, and local attachment. *Environment and Behavior*, 30, 504-519
- Proshansky, H.M., Fabian, A.K., & Kaminff, R.(1983) Place identity: Physical world socialization of the self. *Journal of Environmental Psychology*.3, 57-83
- Riley,R. (1992) *Attachment to the ordinary landscape*. In Altman, I. and Low, S. (eds), *Place attachment*, pp.13-36, Plenum Press, New York.
- Rubistein, N. (1993) *There's no place like home: home as trauma: lessons of the unspoken*. In Feldman, R., Hardie, G. and Saile, D. (eds), *Power by Design*. The proceedings of the Twenty-fourth Annual Conference of the Environmental Design Research Association, p. 267-272. Oklahoma: Edra Press
- Sime, J.D. (1986). Creating places or designing spaces? *Journal of Environmental Psychology*.
- Shamai, S. (1991). Sense of place: an Empirical Measurement. *Geoforum*, 22:347-358
- Stedman, R.C. (2002). Toward a social psychology of place: predicting behavior from place-based Cognition, attitude and identity, *Environment and Behavior*, 34(5):561-581
- Stedman, R.C.(2003). Sense of place and forest science: toward a program of quantitative research. *Forest Science*, 49(6):1-8

