**Telajakan** and mixed gardens landscape as household based agroforestry supports environmental aesthetics and religious ceremonies in Bali

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**Abstract.** Telajakan and mixed gardens are land management systems in Bali. The existing plants are a combination of tree plants, shrubs, palms, bamboo and others by combining agricultural crops and or livestock. This practice is found in one land management unit to the landscape of rural agroecosystems. In the agroforestry system, this system is more of a family-based activity (household-based agroforestry). This study discusses and examines the value of plant species, as well as the benefits for the household level in Tabanan Bali. The study was conducted from January to June 2019 in Pinge Village, Tabanan Regency, Bali, which is a village that provides green space and the beauty of environmental aesthetics. Observation of various species of plants was carried out using Quick Biodiversity Survey (QBS) method, the complementary of the Rapid Agro Biodiversity Appraisal (RABA) method. The observations were carried out on 40 plots representing agroforestry land-use systems. The results showed that the biodiversity and species richness level belonged to the medium category. There are 55 plant species from a combination of agricultural and forest plants. The vegetation structure of Telajakan and mixed gardens guarantees a natural regeneration process. Telajakan and mixed gardens cause the development of commercial species with high economic value and fast-growing species. The plants used by the community for aesthetics, religious ceremonies, food, medicines, building materials, and household utensils. Most of the purposes of use are for green open spaces and environmental aesthetics, subsistence consumption. The results of other plants that are useful for commercial purposes are special crops that are cultivated intensively. The community believes that by observing the environment and the aesthetics of nature is the realization of worship in the relationship between humans, nature and God (Tri Hita Karana).

**Keywords:** Telajakan, household based agroforestry, aesthetics and religious ceremonies.

1. **Introduction**

Telajakan is part of the green open land around the settlement located on the main road or village road in front, beside or behind the yard of the house, including the road itself, sewer and drainage, yard and others. Thus it can be said that Telajakan has a very important role. In general, Telajakan provides beauty, because the land around the settlement will look green with trees or shrubs and flowering plants, this gives the eye coolness that sees. Telajakan is also a symbol of the character of the homeowner. For example, if the house owner is lazy or always busy, it can be seen that his house's
Telajakan will seem neglected, while homeowners are aware of the importance of Telajakan, then a neat arrangement of Telajakan can be seen in accordance with the provisions in the rules for making Telajakan.

Telajakan play a role in maintaining environmental balance. With Telajakan, the environment becomes organized, so that it is balanced. Water infiltration land is still maintained by Telajakan. Not all housing areas are in the form of buildings, on the remaining land in the housing area, Telajakan is formed, which also functions as a water catchment area. Groundwater reserves are still available with the help of Telajakan as water absorption into the ground during the rainy season. Besides, Telajakan also produces O2 in the presence of plants grown in Telajakan. Thus the availability of O2 in nature will still be balanced. Irresponsible also makes biodiversity maintained. Indirectly, homeowners certainly plant various species of trees or plants following the requirements of Telajakan. Trees also provide a means for birds to move places, from one place to another in the immigration process (as a haven for small birds that cannot fly for long). Thus, Telajakan also plays a role in maintaining the diversity of animals, especially birds.

Telajakan and mixed gardens are traditional land management systems in Bali. Existing plants are a combination of trees, shrubs, palms, bamboo and others by combining agricultural and or livestock crops. The practice is found in a single land management unit to a landscape of a rural agroecosystem. In agroforestry systems, this system is more on family-based activities (household-based agroforestry). Spatial Planning presents an opportunity to increase resilience to climate change in vulnerable areas of cities [1]. Telajakan that have been converted into buildings will eliminate the aesthetic function, green open space, and water absorption. This study aims to identify and assess the value of plant species diversity, as well as its benefits for the level of rural households (families) in Tabanan Bali.

![Figure 1. Telajakan in Penglipuran, Bali Traditional Village, Bangli Regency, Bali [2]](image)

2. Methods
The study was conducted in January to June 2019 in Pinge Village, Tabanan Regency, Bali, a village that maintains a green open space and environmental aesthetic beauty. Observation of plant species diversity was carried out using the Quick Biodiversity Survey (QBS) method in addition to the Rapid Agro-Biodiversity Appraisal (RABA) method [3][4]. Observations were carried out on 40 plots (2 m x 5 m) representing (more than 10% total area) agroforestry land-use systems (SPL) (Telajakan and mixed gardens). The research location can be seen in Figure 1.
3. Results and Discussion

The results of the vegetation analysis recorded 55 species of plants that are members of 15 families. The plants species were grouped based on the classification of [5] into annual plants, annual crops and weeds. Annual plants can be trees, shrubs and herbs. Annual plants consist of herbs which are agricultural commodities. Of the 55 species found in Telajakan and mixed gardens, there are 17 annual plants species, 30 annual crops species and 8 weed species. There are differences in the number of species when compared to community gardens in the Cinangka Banten area based on the results of [5], there are 179 species of annual and annual plants and 62 weed species. Bali as part of Indonesia has some of the extensive tropical rainforests and biodiversity in the world [6].

Telajakan and Mixed Gardens in Bali are fewer in number because the plant species in the garden are already affected by fast-growing woody trees resulting from population planting. Some plants in the garden have certain characteristics or functions. For example, Jatropha curcas, Saccharum officinarum, Morus alba and Plumeria acutifolia plants as hedgerows which are limiting ownership of Telajakan or gardens. Glyricidia sepium is planted by the community as a living fence between the garden area and the village road. The Ficus benjamina tree is still maintained by the community to guard the springs and holy sites. The Engelhardia spicata tree is maintained by the community in the cemetery area or family grave. Sesbania grandiflora turi plants are planted by the community on the edge of the garden bordering the river or rice fields. According to Shannon-Wiener index, the level of biodiversity and richness of plant species were in the moderate category [7].
In the past, the species planted were mostly used for ritual purposes. The planted species provided plant material and flowers for the daily rituals of the Balinese people (offerings to the God). However, at present, the ritual function is not the most important function required by the owner of the *Telajakan* [8]. The results show that aesthetics is by far the most function provided by investment, followed by economic function. The fact that the aesthetic function is provided by almost all of the species planted underlines its importance for the owners of *Telajakan*. The observation that there are almost no weeds in *Telajakan* reinforces the value of the “neat appearance” of *Telajakan* as social status and the growing importance placed on aesthetics.

The village community in the research location is inseparable from the interaction between humans in the social environment. Interaction aims to support the life of each individual because humans with other humans always have flaws. Human social life can be seen in the community environment. If *Telajakan* is associated with social values that exist in society, we can see *Telajakan* provides media to the community as a medium of interaction. As an example *banjar* manners who are doing cleaning work in the area of the front door of the house. It will indirectly blend in. *Banjar* manners become more familiar with each other because they are brought together in this activity. Busyness of the community which resulted in the rare gathering of members of the *banjar* manners became relieved by this activity. *Telajakan* is also a place of knowledge for the community. The community cannot indirectly know the plants species and gardening techniques because they go directly to care for each other’s treatment. Besides, *Telajakan* also provides children with learning in school, especially in the field of natural knowledge. Children become aware of plants and their shapes firsthand because they look directly at the *Telajakan* where they live.

![Figure 5](image)

**Figure 5.** Benefits of plant *Telajakan* producing various flowers as material for prayer and some elephant grass plants for cattle feed (located in Pinge Village, Tabanan Regency, Bali).

4. Conclusion

The results showed that the level of biodiversity and richness of plant species were in the moderate category. There are 55 plants species from a combination of agricultural and forestry plants. The agroforestry vegetation rejuvenated and mixed gardens have positive effect in support a natural regeneration process. Cultivation and mixed gardens have led to the development of commercial species with high economic value and fast-growing species. The community uses the plants species for aesthetics, religious ceremonial materials, food, medicines, building materials, and household utensils. Most of the utilization goals are for green open space and environmental aesthetics, consumption is subsistent. Other crops are partly used for commercial purposes, especially plants that are cultivated intensively. Society believes that protecting the environment and natural beauty is a manifestation of worship in the relationship between humans, nature and God (*Tri Hita Karana*).
References

[1] Mashila T 2014 Spatial planning for climate change adaptation: developing a climate change local area adaptation plan for Khayelitsha (Cape Town: University of Cape Town). https://open.uct.ac.za/handle/11427/13332?show=full

[2] Tika G A 2015 Telajakan, Old Solution New Problem. Kulkul Bali.co. https://www.kulkulbali.co/post.php?a=316&t=Jbb2015_telajakan_solusi_lama_masalah_bar u#.Xd-4d68RXcc

[3] Nurhariyanto, Nugroho H P, Jihad, Joshi L, Martini E J M. 2008. A Quick Biodiversity Survey (QBS) for Rapid Agro-Biodiversity Appraisal (RABA) (Bogor: World Agroforestry Centre). http://old.worldagroforestry.org/sea/projects/tulsea/sites/default/files/inrm_tools/09_TULSE A_QBS.pdf

[4] Kuncoro S A, Noordwijk M V, Martini E, Saipothong P, Areskoug V, Putra A E, O’Connor T 2006 Rapid Agrobiodiversity Appraisal (RABA) in the Context of Environmental Service Rewards (Bogor: World Agroforestry Centre)

[5] Soemarwoto O 1981 Homegardens in Indonesia, Paper for the Fourth Pacific Science International Congress, Singapore, September 1 – 5, 1981 (Bandung: Padjajaran University). http://www.asb.cgiar.org/PDFwebdocs/RABA-report%20version%20submitted2005Sept23.pdf

[6] Purba J H, Sasmita N, Komara L L, Nesimnasi N 2019 Comparison of seed dormancy breaking of Eusideroxylon zwageri from Bali and Kalimantan soaked with sodium nitrophenolate growth regulator. Nusantara Bioscience Vol. 11 (2), 146-152. https://smujo.id nb/article/view/3955

[7] Suratissa D M, Rathnayake U S 2016 Diversity and distribution of fauna of the Nasese Shore, Suva, Fiji, Islands with reference to existing threats to the biota. Journal of Asia-Pacific Biodiversity 9 (2016) 11-16. https://www.sciencedirect.com/science/article/pii/S2287884X15001065

[8] Sarwadana S M and Lila K A 2016 Pelestarian Telajakan untuk Menjaga Keseimbangan Ekologi dan Menjaga Lingkungan yang Sehat di Sekitar Kota Denpasar (Denpasar: Udayana University). https://simdos.unud.ac.id/uploads/file_penelitian_1_dir/794364b7ade60422d733d2d325105f 65.pdf