THE ARCHITECTURE OF PESANTREN: CURRENT ISSUES, CHALLENGES AND PROSPECT FOR DESIGN FRAMEWORK

INTRODUCTION

Pesantren (Islamic boarding school) is a unique form of the traditional Islamic education system in Indonesia and has spread to Southeast Asia and neighboring countries, albeit in various local names [1] [2]. After Clifford Geertz published his research about santri and abangan [3] [4], studies about pesantren were done by many researchers, mostly about pesantren as an education system [5]–[7]. Some scholars learn pesantren within the dynamic interaction between traditional and modern education [5] [7] and note that there are adaptations of the unstructured tradition of education into a more structured modern education system [8] [9]. However, studies on pesantren rarely address physical elements, let alone architecture. Studies in this area mainly address deficiencies such as poor conditions, uncomfortable situations, and overload capacity in the dormitory of pesantren [10].

Understanding pesantren requires a historical overview of Islamic educational institutions, which have evolved over generations. In the Islamic world, the history of education started as early as the Prophet Muhammad (P.B.U.H.), who taught his disciples clandestine from house to house to the form of the madrasa that evolved as the “university” exemplified by Al Karaouine University in Fes, Morocco. Students learn Islam in the halaqa system (a circle of learners mainly for memorizing the Quran) and fiqh (Islamic jurisprudence). This halaqa can be conducted nearly everywhere, although mainly concentrated in spaces around the mosque. This halaqa evolves into a more structured madrasa system where specific dedicated places are provided, or the school (madrasa originated from Arabic darasa, to learn) [11]. Unlike the narrow understanding of madrasa as a school system, pesantren is a combination of the madrasa, the dedicated place of learning, and halaqa, the activity of learning circle is conducted in houses of the community around the school, in which all concentrate on the local mosque.

MADRASA AND PESANTREN: OVERVIEW IN DEFINITION, CURRICULUM, AND UNIQUE ARCHITECTURAL TYPE

In Indonesia, the context of pesantren and madrasa still has a confused understanding of the definition, curriculum, and architectural style. Pesantren is a local understanding of madrasa, and it views the Islamic concept of madrasa [2] [12].

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ABSTRACT

Pesantren Islamic Boarding School is an indigenous educational institution originally from Indonesia and perhaps a unique form of the traditional Islamic education system and spreading to Southeast Asia and neighboring countries. However, studies on pesantren rarely address physical elements and architecture. Learning pesantren architecture challenges us with representation: definition, how to visualize its form and program, and the design. Finding a body of knowledge on pesantren to excavate “architectural features” is important to study its prospect in architectural terms. This paper attempts to analyze pesantren from the architectural perspective, focusing on the specific feature and finding its current issues, challenges, and prospects for the design framework. Two combination research methods were used: Systematic literature review and case study. A systematic literature review was conducted in the first stage to map the distinctive spatial quality of pesantren. In the second stage, three case studies were conducted to report and analyze the current issues, challenges, and prospects for the design framework. The research shows that the variety of physical conditions is the main current issue of pesantren. The main challenge is the shortage of financial availability while the spatial need to cater to population and development is more increasing. These conflicting narratives open local responses through incremental design processes in which contextual design frameworks are needed.

KEYWORDS:
The Architecture of Pesantren; Traditional Pesantren; Design Framework

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Madrasa characterized Islam as a combination of pesantren and public school [13]. The development of the madrasa is similar to national development in Indonesia since the empire, colonial period, and independence period. Education in Madrasa changed from the form of recitation in the house to the Khan Mosque Nowadays, it has transformed into school system, as commonly seen across Indonesia [14][15]. This process is the institutionalizing formal process of madrasa [16]. Madrasa as Islamic school is an effort to modernize Islamic education and respond to Dutch Colonial education politics [17] [18]. Madrasa adopted pesantren and the school education system [19]. From pesantren, madrasa adopted the religious sciences and religious attitude [20]. The classical system, general subject, and management education are school characteristics in madrasa [21]. They are believed to be the continuation system of pesantren, modified in the public school system run by the classical system [22]. There are two types of madrasa in curriculum content: The first type is, 30% of religious content and 70% other contents. The second one is 100% religious content [23]. In an architectural aspect, the classical system in madrasa involves the creation of numerous classrooms with a layout of teacher and students seating similar to that in public schools. Residence obligation in madrasa is not mandatory. If there are dormitories in madrasa, there is no close relationship between students and teachers, while in Pesantren, kiai and santri (students of pesantren) are like close family relation. The classroom setting in madrasa is different from pesantren. There are sorogan system (in the centre place surrounded by the santri) and bandongan system (kiai reads and explaines the materials, and santri writes it- like in the classroom setting but sit on the floor). Mosque is not the important place that has to be available in madrasa, same with the house of the head of madrasa and the teachers. Madrasa has a rigid plan for its existence and development, unlike in pesantren. Pesantren is built and developed incrementally based on its needs and the stakeholders (santri, teacher, alumnæ, founding, et al).

Pesantren is an educational institution that prepared santri (students in pesantren) as an agent of change, developing morals and creeds based on the Quran and Hadiths [24] [25][26] [27]. Its educational system grows and adapts to dynamic life based on the demands of the community and is still by Islamic values [28] [29] [30]. The existence of pesantren is the religious response from the local community for acculturation to the local Islamic culture [31]. Pesantren can divergence into two models [32]: traditional pesantren (Salaf system), which conducts religious education and character development, and the modern system (Khalaf system), which teaches religious and general education as well as life skill training and integrated approach that combined these two systems [2]. When the pesantren was founded in the first time in Indonesia is still debated as Pengajian activity after the collapse of the throne of Majapahit [33] or based on the Kuttab education institution during the Umayyad Kingdom [34] or from the pesantren system of Hindus in the pre-Islamic era [35]. Other research stated that pesantren adopted from the Middle East Islamic Education from Al Azhar, Cairo [35]. The five elements of pesantren included kiai, mosque, santri, dormitory, and teaching classical books [36]. In the architectural aspect, pesantren has minimum three room functions: mosque, kiai’s house, and dormitory for santri. The mosque in pesantren is a multifunction room; a place for prayer, and a communal space that pushes social cohesion between santri. The dormitory structure in pesantren indicated simplicity, humility and politeness. Many parties claim that pesantren is an indigenous educational system in Indonesia based on not only Islamic tradition but also the culture of local communities [6], [28], [37].

In Indonesia, the term madrasa has already manifested through a structured curriculum and materialized as a school building, imitating ordinary public schools but offering more Islamic subjects [10], [38]. Pesantren, however, has been evolving into a more distinct feature recognized by its elements: Dormitory, mosque, the presence of respected teacher (kiai), and students (santri) who learn traditional Islamic books of Yellow Book (Kitab Kuning) [39]. Kiai of pesantren is central, which may be extended to their kin, and this inheritance authority creates a network of learner communities [40]. In the modern era, this educational system has been institutionalized outside the formal educational system, where it allegedly marginalized [39], [41], and as the space of indoctrination [7].

The historical narrative above invites two intriguing fundamental questions in architectural discourse. The first is how to explain the narrative above through spatial and architectural language and theory. Can we “define” pesantren architecturally? Can we reveal the phenomenon through space? Can we develop spatial representations or architectural vocabulary from the phenomenon, such as the form and program or the armature and fabric, to borrow the City’s duality [42]? The second will be the question of prospects, especially in creating theoretical ground for designing pesantren within the new context of information flow. Manuel Castells has rendered that this information technology age is reshaping society and the world city system [43]. Now, learning can be borderless and can be taken from everywhere, hence the pesantren meets its critical challenge: its existence and relevance.

**DESIGN FRAMEWORK BY PLOWRIGHT AS THE FUNDAMENTAL BENCHMARK TO VIEW THE PROSPECT OF DESIGN FRAMEWORK IN PESANTREN**

Plowright stated that the fundamental design framework is force-based, pattern-based, and concept-based [44]. The force-based framework focuses on the design thinking and negotiation of complex forces and all forces accessible and ordered to follow up by the designer. Object in this framework has structural and behavioural relationships. Negotiation is an important
part of this framework. The second framework is pattern-based. This is believed to be the core of architectural design. This framework focuses on pattern application. Cultural and social content is still present in this framework but held in a pattern that is applied independently. A concept-based framework allows designers to use metaphors, analogies, questions, and big ideas. The concept organizes all aspects of architectural design into final form. This framework is around the creation of a central idea to manage part of the part of the design proposal.

The design framework in pesantren was recently in the grey area, while this building typology resembles a combination of residential and school functions. However, its presence as a traditional education institution existed organically amid a local culture based on community needs in rural contexts. Plowright framework seems to be one analysis strategy to propose the prospect of design framework.

METHODS

Methodologically speaking, in answering the above questions, this research utilized a combined method of Systematic Literature Review (SLR) and case study. The SLR was used to mine architectural vocabularies from the pesantren literature addressing the first domain of the research question. Research needs to explore how far pesantren studies in Indonesia and Asia have gone by much research since the first publication of Clifford Geertz about pesantren in East Java.

The case study was utilized as the testing ground of the first step finding to develop the mapping of spatiality and architecture of pesantren. This mapping was the first step towards design theory for pesantren in the context of the information age. Both methods are described in detail in the following part.

INITIAL SCOPING OF SYSTEMATIC LITERATURE REVIEW (SLR)

Our literature study started with general mapping to see how pesantren were studied. We found that Clifford Geertz’s anthropological study was the foremost research on pesantren as early as 1960, although there is less description of the architectural context. The relation of each paper in any context draws as connected paper in Figure 1 and drives to make any framework to literature mapping. Finding this initial research, we began our systematic literature review, from 1960 to the recent to mine architectural vocabularies in pesantren discourses.

![Figure 1. Connected studies about Pesantren from Clifford Geertz Research](source: connected paper.com)

DATA SCREENING PROCEDURE OF SLR

We utilized Publish or Perish by Harzings to extract the Scopus abstract and citation database index with the word “pesantren” as a search string in the keywords and title. Table 1 shows the result of the scrapping. In comparison, researchers also see the literature from connected papers to find out about the first study in pesantren in a whole context.

<table>
<thead>
<tr>
<th>Table 1. Data Collection Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Search by Harzing of PoP on Scopus</td>
</tr>
<tr>
<td>-----------------------------------</td>
</tr>
<tr>
<td>First screening: search string “pesantren” in keywords and title</td>
</tr>
<tr>
<td>Second screening: selecting only journal articles in English</td>
</tr>
<tr>
<td>Third screening: selecting relevant articles through abstract reading, mentioning, or indicating relevance on the physical aspect of pesantren</td>
</tr>
<tr>
<td>Fourth screening: reading the journal content relevant to research questions</td>
</tr>
</tbody>
</table>
We treated 14 articles as our primary data. Analysis was performed by coding all relevant words or issues to extract any relevancy to architecture. We identified some variables: location, general issues or problems related to architecture, and detailed information on the properties such as size, characters, etc. To add the location detail, we traced the exact coordinates of the research object/advanced pesantren mentioned in the article through searching with Google and Google Maps to determine their distribution and the spatial context of the studies.

CASE STUDY

We noticed that architectural characterization from the literature alone would not give a deeper understanding of architecture of pesantren. Hence, a case study was necessary to “validate” the significance of architectural characterization in real space, the current issues, challenges, and the prospect for a design framework. We set some methodological background to choose the cases, namely: (a) the availability of access to the area and the internal stakeholders of the pesantren, (b) the possibility of showing a variety of morphology rather than choosing a similar type of pesantren, (c) possibility to find an exemplary case, i.e., the good practice of architectural and spatial quality. Three traditional pesantren in Central Java were chosen, namely (a) Pesantren Al-Hikmah Benda, Brebes (location: GPS 7.220613657331574, 109.03803739721303, (further abbreviated as “AHP”), (b) Pesantren Asrama Pendidikan Indonesia (API) Tegalrejo, Magelang (location: GPS 7.461904621186556, 110.26765076838026) (further abbreviated as “API”), and (c) Pesantren Pabelan, Muntliian (location: GPS 7.577610804548677, 110.25688161507706) (further abbreviated as “PPM”).

These three pesantren are in Central Java and they have many santri (students). AHP has about 8000 santri, API has about 5000 santri, and PPM has about 2000 santri. They are in the rural-urban fringe. AHP is near the City of Brebes, API is near Magelang, and PPM is in Muntliian. All of them are medium-sized cities in Indonesia. Architecturally, PPM has distinctive characteristics as the Aga Khan Award IV of Architecture recipient in 1977.

METHOD OF ANALYSIS AND CONCLUSION STRATEGY

The Analysis started with the primary data from the literature review, mentioning the keywords that appear in the paper related to architecture vocabulary through the summary of architectural issues in each research. Each keyword about architectural vocabulary is analyzed and grouped into two analysis strategies: depictive and normative narrative analysis that uses 2 of 3 types of architectural critics by Wayne Attoe (Attoe, 1981). The research also did a comprehensive analysis by comparing the substantial literature review to three case studies of traditional pesantren to prove how dynamic the empirical studies of pesantren are and conclude about the current issues and challenges in pesantren. In the case of studies, the research analyzed three pesantren for the spatial information, the development of spatial and room of pesantren, including the role of kiai in improving the building. Empirical Analysis is about what exactly happened in Pesantren that related to the architectural studies to conclude the morphology of pesantren and tried to make any speculative design framework in pesantren that can help understand the process of architectural design in pesantren. The design frameworks model by Plowright was used to analyze the prospect of design frameworks in pesantren. The forces, patterns, and concepts in the three case studies are described as the proposed potential framework in the architecture of pesantren.

RESULT AND DISCUSSION

RESULT AND DISCUSSION FROM SYSTEMATIC LITERATURE REVIEW (SLR) PROCESS

Fourteen articles were examined as primary data to analyze architectural vocabularies of pesantren; the details are presented in Table 2.

Table 2. The List of Primary Data

<table>
<thead>
<tr>
<th>References</th>
<th>Research and detail location</th>
<th>Architectural issues</th>
<th>Architectural Words Utilized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nilan [45] (2009)</td>
<td>Makassar, Indonesia</td>
<td>examples of poor physical conditions</td>
<td>two stories cement block buildings, no glass in the window, boys’ personal dormitory space, dysfunctional toilets, classroom, dormitory blocks, crowded space</td>
</tr>
<tr>
<td>Authors and Year</td>
<td>Location</td>
<td>Key Aspects</td>
<td>Architectural Elements</td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Hamid [46] (2012)</td>
<td>District of Sumedang, Indonesia</td>
<td>historical narrative in developing learning facilities</td>
<td>Kia'i's house, laboratory, waqf areas, learning places, meeting hall, canteen, library, cooperation pesantren</td>
</tr>
<tr>
<td>Muni fah et al. [47]</td>
<td>East Jawa, Indonesia</td>
<td>facilities for public interest and use</td>
<td>laboratories, space for learning, library, bathroom, parking area, study room</td>
</tr>
<tr>
<td>Rahti kawa tie et al.</td>
<td>Pacet, East Java, Indonesia</td>
<td>physical facilities dedicated to increasing student's achievement</td>
<td>school facilities, library, facilities for extracurricular activities, classroom</td>
</tr>
<tr>
<td>Fijriah and Ellisa [49]</td>
<td>Jombang, East Java, Indonesia</td>
<td>The Ngolok Barokah ritual is the main basis for the city transformation process and its impact on urban growth</td>
<td>residential area, rented houses, dorm area, cemetery, lodging, restaurant, houses for shops, public toilets, prayer room, souvenir shops (GusDur) tomb, The City's morphology, the city icon (museum, monument, terminal)</td>
</tr>
<tr>
<td>Sudra Jad and Wibisono</td>
<td>Krapyak District Yogyakarta, Indonesia</td>
<td>three layers of spatial systems of Islamic religious activities within urban fabric area: religious, philosophy axis, and socio-cultural layer</td>
<td>mosques, mushalla, prayer room, spatial pattern, residential, morphological attributes, commercial, mix use, settlement</td>
</tr>
<tr>
<td>Bakri [51] (2021)</td>
<td>Banda Aceh, Indonesia</td>
<td>important aspects for eco-pesantren</td>
<td>classroom, dormitory, thermal comfort, building orientation, cross ventilation system, green open space, unorganized interior layout, the opening element, natural ventilation system, urban setting</td>
</tr>
<tr>
<td>Herda yati et al. [52]</td>
<td>Lebak District, Banten, Indonesia</td>
<td>Infrastructure in Pesantren during Covid-19</td>
<td>study room, dormitory, worship area, living room, kitchen, toilet, bathroom, social activities area, independent isolation room</td>
</tr>
<tr>
<td>Nurtawab and Wahyudi</td>
<td>Pesantrens in Indonesia</td>
<td>Facilities needed by pesantren in learning activities</td>
<td>classroom, dormitory, mosque</td>
</tr>
<tr>
<td>Fahmi et al. [54]</td>
<td>Bali, Indonesia</td>
<td>design strategy by avoiding religious symbols</td>
<td>room for adherents' various religious belief, no religious symbols in the building</td>
</tr>
</tbody>
</table>
Table 2 shows that pesantren’s research locations from fourteen papers are mostly in East Java and West Java of Indonesia, and one is overseas, namely in Thailand (figure 1). From careful mapping, we also notice that pesantren are typically rural in coastal areas, especially in East Java.

ARCHITECTURAL INFORMATION FROM SLR PROCESS

The table also shows that all articles addressing the architectural issue have a variety of perspectives. Generally, all papers do not focus on architecture studies or building design as a body of knowledge. No research is specific about architectural building design. No authors are architects or affiliated with architectural schools. Nevertheless, they address room conditions or other spatial-related notions through the lenses of educational issues. The relation to architecture is impressed from descriptions of activities held in or around pesantren.

Figure 2 shows the words utilized in the articles. The words associated with study (classroom, study room, library) are the most frequent in articles, followed by words associated with living (dormitory, bedroom, bathroom), and then by places of religious activities (mosque, prayer room). Plenty of words show the ‘detail’ of architectural elements associated with pesantren.

ARCHITECTURAL INFORMATION FROM SLR PROCESS

<table>
<thead>
<tr>
<th>Authors</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muafi ah et al.</td>
<td>Ponorogo, Indonesia</td>
<td>child-friendly indicators for facility and infrastructure in three types of Pesantren (salaf, semi-modern and modern)</td>
</tr>
<tr>
<td>Sauri et al.</td>
<td>West Java, Banten and Jakarta, Indonesia</td>
<td>three types of room for santris’ activities; a physical symbol of the building; values in the mosque, dormitory and surrounding community</td>
</tr>
</tbody>
</table>

We may learn from the cloud of words that those three architectural features are indeed the main features of pesantren. The rest of the words may also suggest the importance of addressing the ‘level of detail’ of pesantren. We may distinguish into two different revelations in text: words showing spatial entities and conditions as needs (such as meeting hall, shop, parking area, etc.) and issues (dysfunctional toilets, crowded spaces, etc.). In designing pesantren, this information must be addressed and inviting the method of user expectation and experience checklist as a client and user participation.

Furthermore, we expanded further the main perspectives of the article when dealing with the architectural feature in the following detail. We recall Wayne Attoe’s elaboration on architectural criticism [56] to frame the perspectives of the narrative in the articles.

DEPICTIVE NARRATIVE FROM SLR PROCESS

This narration shows architecture in a general report of pesantren condition, the formal aspects, including its deficiencies. All papers discuss pesantren as the context of the study. Twelve studies in pesantren, two studies (around Pesantren Tebuireng and Pesantren Krapyak) for urban studies and city
planning, and the impact from pesantren. No research was studied on architectural building design. Twelve papers discussed the physical facilities in general and the conditions. Two papers exposed local wisdom principles in pesantren and harmonization in minority areas.

Two papers explain pesantren and its impact on the surrounding settlements in urban design and city planning. Important facilities, such as dormitories, classrooms, and mosques, are seen as the existing condition, in a bad or good condition, as the support facilities for main activities in pesantren; teaching and learning religious knowledge.

The research analyzes information from non-architectural research topics to understand the physical condition of pesantren. This data explains, after significant research from Clifford Geertz, about pesantren, including viewing architectural context, the locus of research is still around the main significant area, East Java, and more around Java Island.

The fourteen articles describe physical facilities as their current issues and challenges. The possibility of improvement for these aspects should start by where pesantren will develop their institution first. Maintaining indigenous values as pesantren should also consider all the areas of pesantren, indoor or outdoor, as the learning place for all pesantren actors (kiai, santri, ustazd, and neighbour).

Firstly, the work from Nilan, Lukens, Hamid, and Munifah stated that pesantren, as a physical facility, accommodates learning space for santri in a modest condition. No comfortable preferences are set as the basic facilities requirement because they argued that users in pesantren must adapt to any situation and condition of their places. As a non-governmental institution, pesantren should make an independent effort to improve the facilities, as in Muazza’s research, and try to make any standard of architecture [58] failed to be fulfilled by pesantren. Any deficiencies, especially in physical accommodation, occur in pesantren throughout the length of the use of a pesantren building. The building standards, that are used to put a minimum target on physical facilities, cannot greatly impact user comfortability. The lower attention on the architectural aspect is caused by pesantren’s consideration. Pesantren considerate that santri have a good level of awareness in learning. They do not prioritize where to study but rather what is studied and its benefits in the future. Two researches focus on building design principles (child-friendly and eco pesantren). For a child-friendly principle, the building of pesantren is protected from natural disasters. The equipment and furniture adjust the safety standards of children. The density limit of the study room is a minimum of 1,75 m2/child. The density limit of a bedroom is at a minimum of 2,5 m2/child. The building inspections exist periodically and each room has emergency kits. Pesantren has evacuation routes and assembly point for an emergency, open green space, field or sports hall, 24 hours security and smoke-free area. Pesantren has adequate bathrooms and toilets (1:30 for male santri and 1:20 for female santri). For eco pesantren, the design principle is that pesantren uses nearby materials, provides green open space, increases the variety and the quantity of vegetation, and provides a habitat for animals.

Secondly is on the innovation in architectural/spatial features, including the impact on city planning [51], [52], [55] [49] and [50]. Pesantren also tries to make the inclusive situation of their building to avoid the majority-minority issues in the settlement as the pesantren in Bali did it for organic tolerance in harmony [54]. As a place with many chances to gather huge population -live in there, or quick visit-, pesantren significantly impact social and economic activities. For example, local faith Ngalap Barokah and the philosophical axis around pesantren in Krapyak [49] and [50] provoke rapid urban development.

Thirdly is the interrelation between space and rituals or any psychological aspect of the users [48], [49]. Pesantren is indicated as the hub and generator of settlement activities. When rituals or places in pesantren have been glorified and become routine traditions, the space in pesantren transformed into a special space for religious value. Many pilgrims include pesantren as part of their pilgrimage route.

NORMATIVE NARRATIVE FROM THE SLR PROCESS

Refers to the building standard in dormitories and educational facilities, what we find in pesantren is far from this ideal standard. From the literature review, pesantren that try eco pesantren and child-friendly building principles have not met the ecologically sustainable development principles in using renewable natural resources, creating renewable energy, allowing waste management, and improving functional adjustment and biological diversity [57]. Universal consent about green architecture that defines the understanding of environment-friendly architecture [58] failed to be fulfilled by pesantren, especially in ventilation systems and landscape plans to maximize passive solar energy and energy-efficient lighting. The basic reason for these issues is that the plan of pesantren is not guided by an architect or building designer from their first existence to the development stages. All stages are in the incremental process, so many requirements of basic building standards for sustainability still need to be implemented, although pesantren has a large area for development.

Child-friendly building principles in pesantren are another ideal standard for pesantren because in many traditional pesantren, santri starts from the age of elementary school level (6/7 years old). The indicators for these criteria come from the UNICEF standard [59] for child-friendly spaces (CFS) consisting of places affected by a natural disaster, including play, recreation, education, and psychosocial support
facilities. It is fine for pesantren with stable finances and plans from the beginning before the construction. However, in the real condition, many pesantren grow and thrive to community needs that the first focus on accommodating a considerable capacity of santri who live there, rather than thinking the ideal condition of the building in specific criteria for children. Specific criteria about the proposition of total toilets to the amount of santri and ratio of beds in pesantren are hard to apply because of the nature of pesantren. There is no selection in the number of santri. It depends on how to spread more influence in religious study and Quran learning without seeing the ability to accommodate santri in sufficient and proper capacity.

RESULTS AND DISCUSSION FROM CASE STUDIES
ARCHITECTURAL INFORMATION FROM THE CASES

We did spatial research in three traditional pesantren: Pesantren Al-Hikmah in Brebes, API (Asrama Pendidikan Indonesia) in Tegalrejo, and Pesantren Pabelan. They inform some aspects both in a physical building and its context. All research objects have a similar type of building and activities: dispersed in one complex of Pesantren, have many santri live in there and organic existence in the building development and recently have a significant role to the around communities in the socio-culture and physical development aspect.

Pesantren AHB. Pesantren AHB is in a rural area with around 8000 santri. The facilities in this pesantren are mosque, auditorium, dormitory, commercial area, house of kiai and ustadz, and classroom.

Pesantren API. API is in a rural area in Tegalrejo, Magelang, Central Java. It has around 5000 male santri and stay in the first location of pesantren. The spatial layout incrementally develops from the first building, consisting of a multifunction room, house of kiai, dormitory, mosque, and inner court to treat santri disciplinary, also the cemetery of the founding father of pesantren (Kiai Chudlori) that located at the back of pesantren. All male santri stay in 3 stories dormitories, learning and memorizing the Quran in the dormitory, classroom, hall, and multifunction room. Pesantren API has a new four-stories building in front of pesantren for the guest hall, classroom and prayer room, and office for pesantren administration. Each 16 sqm room in a dormitory is occupied by around 40 male santri.

Pesantren PPM. PPM is in a rural area in Mungkid, Magelang, Central Jawa. It is Pesantren Pabelan. Since the 1980s, almost 1000 santri have lived there. Neighbors around pesantren, who had the skill to teach santri about life skills knowledge, are allowed to teach in the Pabelan education system. The building was developed from local materials around pesantren and built by kiai and santri daily. The dormitory, classroom, and mosque were built sequentially through the development of pesantren and by alumnae contribution. Pabelan received the Aga Khan Award, the architectural prize, to appreciate their local commitment to the architectural context of the building.
From the cases above, we built a matrix to frame deeper information. The existing spatial information was gathered through deictic observation. The commentary narrative was developed by evaluating the spatial condition from a normative point of view. The realizer narrative was developed by carefully interpreting of stakeholders' (kiai, teachers/ustadz, and santri) expectations.

### Table 3. The Architectural Features of Case Studies

<table>
<thead>
<tr>
<th>Pesantren</th>
<th>Spatial Information</th>
<th>Commentary Narrative</th>
<th>Expected Realizer Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHB</td>
<td>mosque, dormitory, classroom, hall, sports hall, commercial facilities, Kiai's house, library, pharmacy, canteen, radio office, clean water facility, management building for fishpond, coffee production building, building for santri's parents</td>
<td>scattered building configuration, developed from Kiai's house</td>
<td>Inclusive spatial development in and around the pesantren complex. Need more public space for free access neighbours as the social empowerment responsibility of pesantren.</td>
</tr>
<tr>
<td>API</td>
<td>mosque, dormitory, classroom, multifunction hall, guest room, office, Kiai's house</td>
<td>scattered building, developed from the main building</td>
<td>The oldest building exists as the symbol of Pesantren's history. Need a new building for supporting activities and dormitory through the increasing amount of santri</td>
</tr>
</tbody>
</table>

Develop in the middle of a residential area, no street boundary like a fence, main access, also neighbour access to the Pabelan River Society is the strategic control for santri activities, together with pesantren in teaching learning culture

Considering three case studies, the architecture of pesantren does not explicitly emerge by its physical attributes. Research can learn from the morphological pattern of complex mass in pesantren and the building function there. Specifically, learning morphology can analyze built parts and open spaces without being isolated from the context [60]. Recently, the need for facilities of pesantren, not only the house of Kiai, dormitory, and mosque [8] but also other supporting facilities that can help the activities of santri. Modern facilities such as sports halls, libraries, commercial facilities, and guest rooms are needed by pesantren to support their institution’s mission-vision. The morphology of pesantren occurs incrementally depending on the availability of funds and the need for pesantren in capacity. The development of pesantren started from the first place when Kiai opened the Quran learning in his house which dispersed between the house of Kiai, the dormitory, and the mosque.

**MORPHOLOGY IN PESANTREN**

The case study taught us the vocabulary of pesantren architecture that developed from simple residential and mosque functions to multifunction. As the basic learning in pesantren, the halaqa system requires any place in pesantren as a learning place for every component user. Three pesantren draw that in a whole area of pesantren. Our Table 3 simplifies our intention in developing a design framework for helping pesantren. The framework we propose is not in a sophisticated theoretical manner, but it is to keep the method simple and directly applicable for stakeholders of pesantren.

In creating the possibility to “write the future” for pesantren as design apparatus, we recall Françoise Choay’s “The Rule and the Model” [61]. Choay differentiates theoretical writing on architecture and urbanism into the commentator and the realizer genre. Text characterization aims to develop an autonomous conceptual apparatus to conceive and build new and unknown space forms. The role of this text is to create mechanisms for generating built space. We saw that the above narratives fit this commentary narrative similar to Attoe [31]. What is still missing is the realizer. We saw from the cases that the realizer narrative is needed for pesantren development that attempts to point to the materialization and implementation in producing architecture.
CURRENT ISSUES AND CHALLENGES IN PESANTREN

The research shows that current issues in pesantren are architectural and non-architectural issues. For architectural issues, this research found that although the room variation in pesantren is good enough to accommodate their santri, the appearance of this room was an incremental process. They do not have any rigid master plan from the beginning, so development depends on the incidental needs of pesantren. This unplanned design made the crowd issues in the complex of pesantren. The total number of santri that live there makes the internal high-density population in pesantren. Many users have flexible access to improve pesantren, but it is in less coordination with the main important point of pesantren development. The less coordination makes the uncontrolled development on it. Another is about the health condition of physical buildings in pesantren. The cleaning quality of the rooms in pesantren has yet to give any guarantee of the minimum standard of healthy building quality. The overcapacity of users in pesantren caused the management not to handle this maintenance aspect smoothly. In the middle of the rise, pesantren education is needed. Pesantren and its area cannot anticipate this overcapacity issue. They only try to make some adjustments to the capacity. Development efforts to make any branches of pesantren sometimes have obstacles related to the regeneration process. A recent community needed is the public school in pesantren. These conditions affected the new challenges to pesantren.

THE PROSPECT OF DESIGN FRAMEWORK IN PESANTREN

The research found that architectural features, including the design framework in pesantren, have yet to be mentioned like other building’s typology, e.g., school, hospital, house, or office. In curiosity, the combination of residential and school building typology can trigger the Analysis of the design framework in pesantren. Basic assumptions about pesantren refer to five elements of pesantren: mosque, house of kiai, dormitory, santri, and pesantren curriculum. House of kiai is the first place in pesantren and the first place of the activity in pesantren. The additional facility goes to the dormitory for santri before living with kiai and his family. The next one is a mosque. If the pesantren have a larger area for development, a mosque will be built near the house of kiai and the dormitory. However, if not, prayer activities, including teaching, are held in the place of kiai. The process of constructing the building in pesantren follows the functional framework and land availability. They need to prioritize the building’s user capacity to enhance and develop pesantren.

Regarding the spatial configuration in the pesantren complex, there are no specific preferences except the mosque’s orientation, which must be located from west to east (qibla orientation). Most of the houses of Kïai are naturally the center of the pesantren complex, with a mosque and dormitory around it. This speculative design framework can be used as the early studies about the architecture of pesantren.

Pesantren’s design framework is analyzed with the Plowright design framework model. The research found that in three case studies, it was dominantly with incremental processes in design activities. From the beginning, the pesantren started with the house of kiai, and then the design process went to the priority of the pesantren to develop. The location and function of the new building depends on need and land availability in pesantren. Sometimes, pesantren did land expansion to their neighbour in a swap model. They occupied the neighbouring area and then swapped it with the Pesantren area in another location to change it. All the case studies did not have any master plan from the first time, so it caused a random design process and development. It was exciting in pesantren when we saw how far the role of many actors in the design process is. Ownership in pesantren not only in Kïai as the head but also in alumnae, foundation, santri, external donator including in the idea of building design and new function. This incremental-based framework was analyzed using the Plowright model and described in table 4.

Table 4. Analysis of Research found about the prospect of design framework in pesantren using three Plowright Models

<table>
<thead>
<tr>
<th>Framework model by Plowright</th>
<th>The research found in Pesantren</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forces</td>
<td>1. Spatial limitation</td>
</tr>
<tr>
<td></td>
<td>2. Open the possibility to enclave or integrate with the community’s rural/urban fabric</td>
</tr>
<tr>
<td>The usual pattern in Pesantren</td>
<td>1. Basic configuration of Kïai house, dormitory and mosque where position and orientation of new building considered by kïai house as the first existing mass.</td>
</tr>
<tr>
<td></td>
<td>2. Spatial morphology pattern of around village/settlement</td>
</tr>
</tbody>
</table>

Kiai in pesantren is the critical point of improvement and development of the architecture of pesantren. His patronage can bring the existence of pesantren to the community and larger. In three case studies, the vision and mission of pesantren about physical development planning started with the kiai idea. Pesantren’s spatial pattern closely relates to the village or settlement around pesantren. Usually, because the first building for pesantren activities is in the kiai house located in an existing settlement and rural area, the new mass is considered by this location and orientation. In pesantren AHB, API, and PPM, all the buildings refer to the site of kiai’s house, and development started from this mass. The mass configuration also relates to considering the existing spatial pattern around the settlement, e.g., prominent street position, natural landscape condition, and land availability of pesantren. Besides the capacity issue, the type of local houses around pesantren was not crucial.
for pesantren development. It caused the architectural style and contextuality to be less priority than building function, so the strategy to make many rooms that could accommodate santri caused the lack of building context.

CONCLUSION

The architecture of pesantren cannot be definitively drawn as distinctive based on its physical attributes due to its commonalities with non-pesantren architecture. This architecture is simply a collection of “regular functions” of space with no or not necessarily specific symbols or landmarks. However, from morphology, a loose spatial configuration of the mosque, house of kiai, and dormitory create a pesantren complex, which is the core function supported by other amenities. There are parallel notions of these architectural features from the narratives and the cases. This research found current issues in pesantren are in the physical condition and non-building standard requirement. Pesantren focuses on the maximum use of space according to the availability of facilities. So that the lack condition of facilities should have paid more attention to daily activities. Based on space limitations at the dormitory, it is only used as storage for the personal belongings of santri. Poor conditions for the financial aspect to develop building ideal standard and land shortage are the challenges in developing and improving pesantren. The huge capacity of santri exceeds the standard of capacity contrary to the pesantren vision mission that pushes their santri to live in modest conditions without building standard requirements. The incremental method used to develop pesantren caused a big challenge to map the basic configuration of the architecture of pesantren in programming. The prospect for design framework in pesantren is how to formulate and learn the architecture of pesantren itself. The incremental process and many actors are involved in the whole building activity in pesantren, so it would be better to synchronize the expectation from the actors and the actual condition on site of pesantren. The design process in pesantren depends on the user who lives there and the consideration from external parties such as alumni, the local community, and potential donors. The process has the potential to be carried out in linear and parallel stages. From designing problems to generating ideas and communicating concepts, the general framework in pesantren focuses on resolving the capacity issues in pesantren and then following the a pragmatic design solution.

REFERENCES


