

The Recovery, Resilience, and Cooperation (RRC) Framework: An Integrated Policy Analysis for Strengthening the Resilience of the Basic and Secondary Education System in Mojokerto City

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ABSTRACT

Objective: This article aims to analyze demographic dynamics and education participation patterns in Mojokerto City and to formulate an adaptive education policy framework by adapting the Recovery, Resilience, and Cooperation (RRC) framework developed by ASEAN member states during the COVID-19 pandemic. **Method:** The study employs a descriptive qualitative approach within a policy analysis design, combining descriptive quantitative analysis of secondary demographic and education participation data for Mojokerto City for the 2014-2024 period with simple linear regression trend projections to 2034, and content analysis of regional policy documents and international academic literature to adapt the RRC framework to a city-government context. **Results:** The findings show that the number of births in Mojokerto City declined by 25.6 percent between 2014 and 2024, accompanied by a rising share of the working-age population, while the Net Enrollment Rate (NER) for primary education reached 100 percent in 2024, whereas the NER for senior secondary education declined to 71.5 percent. These findings indicate a shift in local education challenges from access expansion toward ensuring continuity and quality of learning across education levels. **Novelty:** The proposed RRC framework, comprising recovery, resilience, and cooperation agendas, is recommended as a basis for formulating integrated education policy responsive to the changing demographic structure of Mojokerto City.

INTRODUCTION

The relationship between demographic structure and human resource development has long been a central concern in public policy scholarship, particularly in regions undergoing demographic transition. The demographic dividend, the potential acceleration of economic growth that occurs when the working-age share of the population grows faster than the non-working-age share, theoretically opens substantial opportunities for raising a region's productivity and welfare [1]. This opportunity is nevertheless conditional: it can only be realized if the working-age population possesses adequate human capital, which in turn depends on the quality and resilience of an education system capable of building human capital from the earliest years of basic education onward [1], [2]. In other words, a demographic dividend window does not automatically translate into a development dividend; it requires education policy that is responsive to changes in population age structure and that consistently safeguards the continuity and quality of learning across education levels.

This phenomenon is directly relevant to Mojokerto City, which experienced a marked shift in population structure between 2014 and 2024. The number of births declined from 2,070 in 2014 to 1,541 in 2024, a decrease of approximately 25.6 percent,

while the share of the working-age population (15-64 years) increased across nearly every age cohort, with the most pronounced rise occurring in the 20-24 age group. At the same time, the data also reveal an emerging trend of population ageing, reflected in the growing number of residents aged 65 and above. The combination of declining fertility, an expanding working-age cohort, and a growing elderly population indicates that Mojokerto City is currently at a demographic dividend moment whose window is limited in duration and is likely to narrow over time.

This demographic momentum should ideally be matched by a strengthened education system capable of sustaining human capital quality across all levels. Yet education participation data for Mojokerto City reveal a paradoxical pattern. The Net Enrollment Rate (NER) for primary education reached 100 percent in 2024, indicating that access to basic education has been effectively achieved. In contrast, the NER for senior secondary education declined from 80.21 percent in 2019 to 71.51 percent in 2024. This pattern suggests that the region's education development challenge is no longer primarily about expanding access at the basic level, but has shifted toward a more complex problem: sustaining educational continuity across levels, particularly during the transition into senior secondary education, at a time when the number of senior secondary students is projected to keep rising through 2034.

This challenge of educational continuity is not an isolated phenomenon; it forms part of a broader set of difficulties facing education systems worldwide in the aftermath of the COVID-19 pandemic. A substantial body of international research shows that disruptions to learning caused by school closures generate learning losses that are cumulative and long-lasting in their effects, particularly for students from disadvantaged socioeconomic backgrounds [3], [4]. In response, international and regional bodies have formulated various education recovery frameworks, one of which is the Recovery, Resilience, and Cooperation (RRC) framework developed by the ASEAN Secretariat together with international partners to guide ASEAN member states in reopening schools safely, recovering learning losses, and building the resilience of education systems against future disruptions [5]. This framework was conceptually designed for inter-state cooperation at the regional level, and its application at the level of local government, particularly city or district governments in Indonesia, remains relatively underexplored in the education policy literature. This gap underpins the relevance of the present study, which seeks to transpose the logic of the RRC framework from a context of inter-state cooperation into a multilevel governance logic appropriate to a single city government, while simultaneously integrating it with structural challenges rooted in local demographic dynamics, a dimension that was not the primary focus of the ASEAN RRC framework, which was oriented more toward the global health crisis.

Building on this background, this article pursues two objectives. First, it analyzes demographic dynamics and education participation patterns in Mojokerto City as an empirical basis for formulating education policy that is responsive to changes in population structure. Second, it formulates and adapts the Recovery, Resilience, and

Cooperation policy framework to the governance context of a single city, providing a conceptual basis for designing basic and secondary education strategies that are adaptive, sustainable, and resilient to various forms of disruption. The remainder of the article is organized as follows: the research method is described, followed by results and discussion covering demographic dynamics, student projections, the urgency of the problem, the integrated policy framework, priority policy options, and implementation risk mitigation, before concluding with a summary of findings and recommendations for further research and policy action.

RESEARCH METHOD

This study employs a descriptive qualitative approach within a policy analysis design, a research design oriented toward supplying a relevant knowledge base for formulating and refining public policy through the synthesis of empirical evidence and conceptual frameworks that have proven applicable in other contexts. This design was chosen because the aim of the study is not primarily to test causal relationships through inferential statistics, but rather to generate contextual understanding and implementable policy recommendations, grounded in valid quantitative data and in conceptual frameworks with empirical support from credible academic literature and policy documents. To this end, the study combines two complementary analytical strategies: descriptive quantitative analysis of secondary demographic and education participation data, and qualitative content analysis of policy documents and international academic literature. The design can therefore be categorized as an embedded mixed-methods study, in which the quantitative component strengthens the empirical basis for the qualitative analysis that constitutes the primary focus of the research.

The data used in this study are drawn from officially published secondary sources. Demographic data, covering population by age group and sex as well as birth and death rates, are drawn from the Mojokerto City in Figures (Kota Mojokerto Dalam Angka) publication series issued by the Central Statistics Agency (Badan Pusat Statistik, BPS) of Mojokerto City for the period 2014 to 2024. [6], [7], [8], [9], [10], [11], [12] Education participation data, covering the number of students by education level and the Net Enrollment Rate (NER) from primary through senior secondary level for the period 2014 to 2024, are drawn from the administrative education database of Mojokerto City. Supporting material for the qualitative analysis consists of the ASEAN regional policy document on post-COVID-19 education recovery [5], together with relevant academic literature and reports from international agencies, including publications by UNESCO, UNICEF, the World Bank, the OECD, and other education research institutions addressing learning recovery, education system resilience, and multi-stakeholder cooperation in education development.

Data collection was carried out through desk research, that is, the tracing, recording, and organizing of secondary data and policy documents that have been officially published by the responsible institutions. This technique was chosen because it

is appropriate to the aggregate nature of the data, which were already available in official publications, so that primary data collection through surveys or interviews was not the focus of this stage of the research.

Data analysis proceeded through two stages that were carried out simultaneously and that informed one another. The first stage consisted of descriptive quantitative analysis, applied to the demographic and education participation data through data tabulation, calculation of period-on-period percentage change, and trend visualization in the form of population pyramids and line charts. At this stage, projections of student numbers for 2029 and 2034 were generated using simple linear regression, operationalized through the Forecast.Linear function in Microsoft Excel, with the 2014-2024 historical data series as the basis for estimation. The second stage consisted of qualitative content analysis applied to the ASEAN Secretariat policy document [5] and supporting academic literature, aimed at identifying the strategic pillars of the Recovery, Resilience, and Cooperation framework and transposing the logic of inter-state cooperation at the regional level into a multilevel governance logic appropriate to a single city government, namely vertical alignment with provincial and central government and horizontal cooperation with peer local governments and non-government partners. The results of both stages of analysis were then synthesized to formulate the urgency of the problem, the integrated policy framework, and the priority policy options presented in the results and discussion section.

The validity of the data in this study was addressed through source triangulation, comparing demographic data across several editions of the Mojokerto City in Figures publication [6], [7], [8], [9], [10], [11], [12] to confirm the consistency of trends across periods, and by examining the coherence between demographic data and education participation data in explaining the same underlying phenomenon. As an explicit methodological limitation, the student projections for 2029 and 2034 were generated using simple linear regression, which assumes a linear pattern of change and is therefore susceptible to distortion from disproportionate fluctuations in the historical data, such as the sharp rise and fall in the number of primary and junior secondary students during the COVID-19 pandemic period of 2020-2021. The projection results in this study are accordingly treated as an indication of directional trend rather than as precise figures suitable as the sole basis for major investment decisions, and they should be complemented by periodic data updates and comparative projection methods in future research and planning. A further limitation that should be acknowledged is that the scope of this study is confined to a single administrative area, Mojokerto City, and does not include qualitative primary data, such as in-depth interviews with education stakeholders, which could enrich the contextual understanding of the quantitative findings presented here.

RESULT AND DISCUSSION

Result

Demographic Transition and the Demographic Dividend Opportunity in Mojokerto City

Mojokerto City is currently undergoing a rapid demographic transition. Declining fertility, together with a rising share of the working-age population and a growing number of elderly residents, are the principal factors driving the changing structure and shape of the population pyramid, as shown in Table 1 and Figure 1. Over the period 2014-2024, the number of births fell from 2,070 in 2014 to 1,541 in 2024, a decline of approximately 25.6 percent (Figure 2). At the same time, the death rate also showed a declining trend after a temporary rise during the COVID-19 pandemic years of 2021-2022. Although natural population growth has consequently slowed, this pattern reflects the fertility decline that constitutes one of the preconditions for a demographic dividend to emerge.

Table 1. Population of Mojokerto City by Age Group, 2014 and 2024

Age Group	Male 2014	Female 2014	Male 2024	Female 2024
0-4	5,345	5,168	4,552	4,294
5-9	5,690	5,550	5,452	5,201
10-14	6,054	5,594	5,957	5,856
15-19	5,362	5,144	5,847	5,777
20-24	5,110	5,109	5,831	5,455
25-29	5,372	5,435	5,403	5,267
30-34	6,541	6,429	5,242	5,195
35-39	5,923	5,705	5,269	5,145
40-44	5,373	5,398	5,858	5,811
45-49	4,912	5,109	5,194	5,040
50-54	4,030	4,503	4,518	4,653
55-59	3,577	3,688	3,881	4,178
60-64	2,582	2,517	2,899	3,555
65-69	1,362	1,701	2,329	2,742
70-74	1,010	1,368	1,366	1,612
75 and above	1,054	1,962	1,049	1,844

Source: BPS Kota Mojokerto [6], [11]

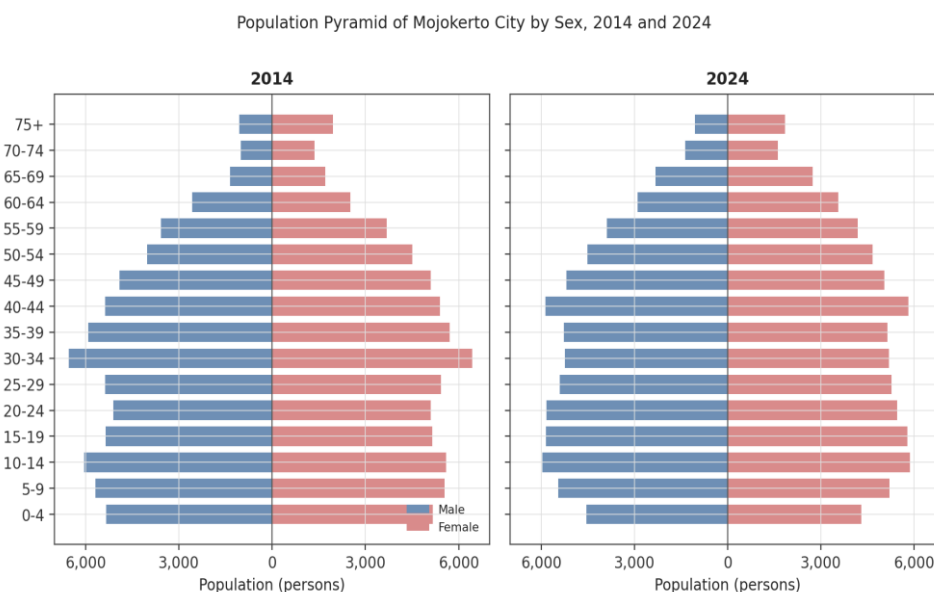


Figure 1. Population Pyramid of Mojokerto City by Sex, 2014 and 2024
Source: BPS Kota Mojokerto [6], [11]

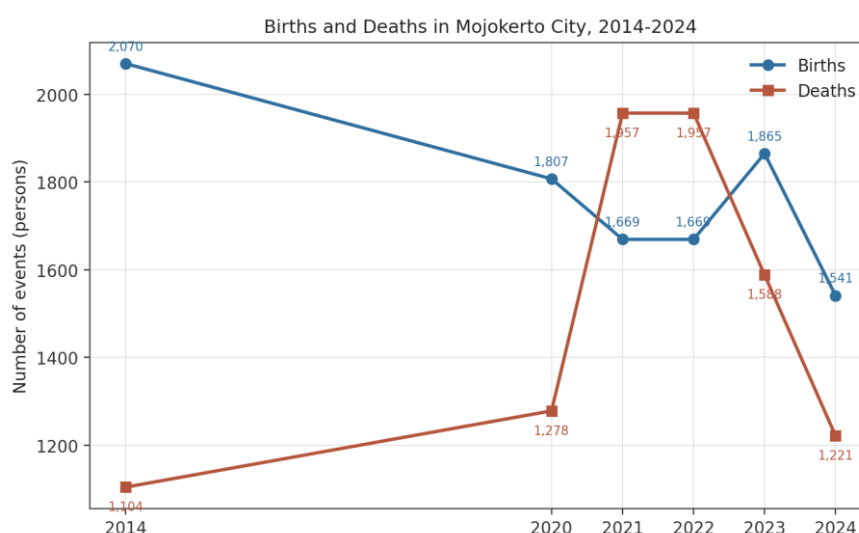


Figure 2. Births and Deaths in Mojokerto City, 2014-2024
Source: BPS Kota Mojokerto [6], [7], [8], [9], [10], [11]

These data point to a substantial shift in the age structure of the population. Compared with 2014, the number of children aged 0-4 declined markedly, from 5,345 to 4,552 among boys and from 5,168 to 4,294 among girls, with a similar pattern of decline evident in the 5-9 age group. This indicates that the number of new births is steadily decreasing, thereby reducing the child dependency burden. By contrast, the working-age population (15-64 years) increased across nearly every age cohort, most notably in the 20-24 age group, where the male population rose from 5,110 to 5,831 and the female population rose from 5,109 to 5,455. Similar increases occurred in the 40-44, 50-54, and 60-64 age groups, indicating that a growing majority of the population now falls within working age. With the working-age share expanding relative to the child population,

Mojokerto City stands to gain a demographic dividend in the form of an expanded labor capacity, higher economic productivity, and increased local revenue, provided that this workforce is effectively absorbed into productive employment [1].

At the same time, the data also reveal an emerging trend of population ageing. Nearly every age group aged 65 and above recorded a substantial increase relative to 2014; the 65-69 age group, for example, rose from 1,362 to 2,329 among men and from 1,701 to 2,742 among women. This indicates rising life expectancy among Mojokerto City residents, but it is also a signal that the demographic dividend window has a limited duration before the city enters a structurally ageing phase. With appropriate policy support, Mojokerto City stands to capture the maximum benefit of this demographic dividend, since accelerated economic growth tends to occur when the working-age population grows faster than the non-working-age or dependent population. Productivity, innovation, and the quality of development during such a demographic transition are also more readily achieved given the growing share of the working-age population within the local demographic structure [1], [2]. This potential, however, can only be realized to the fullest extent if the working-age population attains an adequate level of education, is effectively empowered, and gains access to productive employment opportunities, none of which can be achieved in a short span of time. Building the quality of the population's education requires long-term planning that proceeds from strengthening the foundation at the basic education level, together with near- to medium-term interventions in secondary education and workforce skills, so that the narrow window of the demographic dividend can be captured to its fullest potential. Given the close relationship between the education sector and demographic dynamics, raising education participation (enrolment rates) and the quality of education services is a critical precondition for Mojokerto City to make optimal use of its ongoing demographic transformation.

3.2 Student Projections and the Paradox of Education Participation Across Levels

The consequences of this demographic transition are also reflected in the projected number of students by education level, as presented in Table 2 and Figure 3. According to the projections, the number of students at the basic education level is set to decline gradually, while the number at the senior secondary level continues to rise. At the kindergarten (TK) level, the number of students fell from 5,011 in 2014 to 4,200 in 2024 and is projected to reach around 3,363 by 2034, suggesting that the equitable distribution and quality of early childhood education services warrant periodic evaluation. At the primary (SD) level, after remaining relatively stable through 2020, the number of students declined to 15,594 in 2024 and is projected to reach around 14,541 by 2034. At the junior secondary (SMP) level, after considerable fluctuation, particularly during the pandemic, the figure stood at 8,564 in 2024 and is projected to reach around 7,941 by 2034. In contrast, the senior secondary (SMA) level rose from 11,129 in 2014 to 12,190 in 2024 and is projected to reach around 13,490 by 2034, a trajectory that calls for expanded service

capacity at the secondary level, whether through additional classrooms, teaching staff, or supporting facilities and infrastructure.

Table 2. Number of Students by Education Level, 2014 to Projected 2034

Year	Kindergarten (TK)	Primary (SD)	Junior Sec. (SMP)	Senior Sec. (SMA)
2014	5,011	16,874	9,219	11,129
2019	4,527	16,914	8,987	12,377
2020	3,745	17,401	12,908	12,210
2021	3,961	12,580	4,113	11,832
2022	4,129	16,019	8,648	11,431
2023	4,214	15,754	8,096	11,685
2024	4,200	15,594	8,564	12,190
2029	3,768	15,181	8,268	12,960
2034	3,363	14,541	7,941	13,490

Note: forecast figures for 2029 and 2034 were derived using the Forecast.Linear function in Microsoft Excel. Source: administrative database of the Mojokerto City Education and Culture Office, processed by the author.

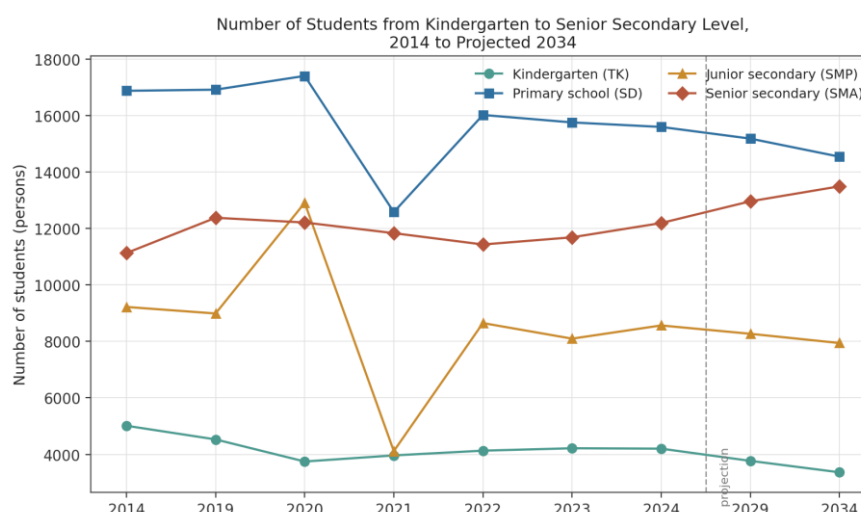


Figure 3. Number of Students from Kindergarten to Senior Secondary Level, 2014 to Projected 2034

Source: administrative database of the Mojokerto City Education and Culture Office, processed by the author.

The pattern of education participation reveals a paradox with important policy implications, as shown in Table 3 and Figure 4. The Net Enrollment Rate (NER) at the primary level rose markedly, from 97.88 percent in 2019 to 100 percent in 2024, meaning that nearly all children of primary-school age are now enrolled at the level appropriate

to their age. In contrast, the junior secondary NER fluctuated within a range of roughly 78 to 88 percent, standing at 83.34 percent in 2024, while the senior secondary NER actually declined, from 80.21 percent in 2019 to 71.51 percent in 2024. This indicates that the projected rise in the number of senior secondary students has not been matched by a corresponding rise in the proportion of senior-secondary-age residents who are actually enrolled at the appropriate level. The central challenge for secondary education has thus shifted from mere capacity provision toward improving access and ensuring educational continuity for the entire school-age population.

Table 3. Net Enrollment Rate (NER) from Primary (SD) to Senior Secondary (SMA) Level

Year	NER - Primary	NER - Junior Sec.	NER - Senior Sec.
2019	97.88	87.37	80.21
2020	97.95	87.38	80.13
2021	97.67	78.92	78.92
2022	97.67	87.99	78.91
2023	99.50	82.31	71.51
2024	100.00	83.34	71.51

Note: NER = Net Enrollment Rate, the percentage of the population in a given school-age cohort who are enrolled at the education level appropriate to that age. Source: administrative database of the Mojokerto City Education and Culture Office, processed by the author.

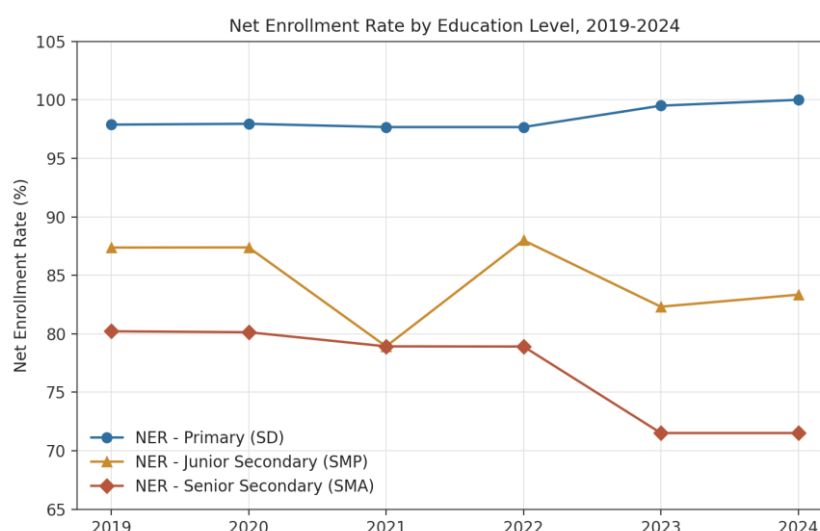


Figure 4. Net Enrollment Rate by Education Level, 2019-2024

Source: administrative database of the Mojokerto City Education and Culture Office, processed by the author.

Taken together, these findings indicate that the declining number of students at the basic education level presents a strategic opportunity to improve learning quality through an optimized teacher-to-student ratio, while the dynamics at the secondary level call simultaneously for expanded capacity and strengthened access and dropout prevention. The paradox between the fully achieved primary NER and the declining senior secondary NER constitutes the empirical starting point for the discussion of problem urgency and the policy framework that follows.

Problem Urgency: Three Clusters of Challenges

Synthesizing the demographic and education participation data together with findings from the global literature on post-pandemic education, three clusters of problems can be identified that underlie the need for an integrated education policy framework in Mojokerto City.

Continuity of School Operations and Readiness for Distance Learning

Keeping schools operating safely during a crisis has proven to be a formidable challenge, while the shift to distance learning has exposed fundamental limitations in the education system. Infrastructure, access to devices and the internet, and the readiness of teachers, parents, and students in general remain inadequate, with pronounced access gaps between urban and rural areas and between higher- and lower-income households [13]. For Mojokerto City, this requires a careful mapping of digital readiness at both the school and household level, since its relative advantage as an urban area does not automatically eliminate pockets of vulnerability among particular socioeconomic groups. Schools, particularly primary schools, should ideally be the last to close and the first to reopen, especially for young learners, because the negative effects of school closures on children's physical health, mental health, and educational development, as well as the broader economic effects on society, are generally too severe to justify such a policy except in genuinely unavoidable circumstances.

At the same time, the delivery of learning in Mojokerto City continues to face a number of operational constraints. Implementation of the Free Nutritious Meals Program (Makan Bergizi Gratis, MBG), for example, requires the realignment of learning schedules and adequate supporting facilities, while limited infrastructure, power supply disruptions that affect technology-based learning, and various other disturbances have the potential to reduce effective learning time. The scheduling adjustments associated with the MBG program differ in nature from these other disruptions, since they stem from a program that actively supports student welfare, meaning that the appropriate response is one of operational coordination rather than risk mitigation against a threat.

Access, Dropout Risk, and Long-Term Learning Loss

In the context of both Mojokerto City and Indonesia more broadly, disruptions to the learning process are no longer dominated by the pandemic but stem from a range of other factors affecting the effectiveness of education delivery. The implementation of national policy continues to shape operational practice at the school level; the MBG program, for instance, requires the realignment of learning schedules, adjustment of

break times, cross-sector coordination, and adequate supporting facilities at school. Such adjustments should properly be understood as a governance consequence of a program that supports student nutrition and attendance, not as a disruption comparable to an infrastructure shock. Infrastructure disruptions, by contrast, such as power outages, limited internet access, extreme weather, and other emergency conditions, constitute exogenous shocks capable of halting learning activities altogether, particularly where schools rely on digital devices. These two categories of disruption call for different responses, namely schedule management and program integration in the case of MBG, and preparedness and contingency planning in the case of infrastructure disruption, both of which underscore that the education system requires adaptive capacity if learning is to continue effectively amid diverse forms of disruption.

Prolonged school closures and reduced instructional hours, compounded by barriers to alternative learning, heighten the risk of dropout, particularly among students from vulnerable socioeconomic backgrounds and during transitions between education levels. Learning losses that are not remediated tend to have lasting effects, since evidence shows that learning deficits at the basic education level compound into larger deficits at higher levels [3]. The decline in the senior secondary NER in Mojokerto City, discussed in the preceding section, underscores the urgency of this issue. Importantly, well-designed long-term remediation not only mitigates such learning losses but can also raise learning outcomes above what would have been achieved in the absence of disruption, meaning that the crisis simultaneously opens an opportunity for reforming learning practice [3].

Widening Inequality and Disrupted Socio-Emotional Wellbeing

The burden of learning disruption tends to fall disproportionately on the most vulnerable groups, including the poorest students, children with disabilities, girls, and children from households with lower parental education. The shift to non-traditional modes of learning tends to widen pre-existing disparities. Beyond the academic dimension, such crises also place strain on students' socio-emotional wellbeing and mental health, evidenced by heightened emotional distress, increased risk of domestic violence, and threats to nutritional security when school feeding programs are interrupted [14], [13]. This wellbeing dimension demands attention equal in importance to academic recovery, rather than being treated as a secondary concern within the broader learning recovery agenda.

The Integrated Recovery, Resilience, and Cooperation (RRC) Policy Framework

Building on these three problem clusters, this study proposes three mutually reinforcing strategic pillars as a framework for strengthening the quality and resilience of the basic and secondary education system in Mojokerto City, as illustrated in Figure 5. This framework is adapted from the education recovery strategy developed by ASEAN member states during the COVID-19 pandemic [5]. Although originally designed to respond to a global health crisis, its underlying principles remain relevant for addressing the range of learning challenges schools face today, given the shared characteristics of the

problem, namely disruptions that threaten the continuity of the learning process, diminish learning quality, and widen achievement gaps among students. The recovery agenda secures continuity and restores losses on an immediate time horizon, the resilience agenda builds preparedness capacity over the medium to long term, and the cooperation agenda provides the institutional mechanism that enables both agendas to be carried out. All three are guided by one shared principle: consistent pro-equity targeting of the most vulnerable groups and strengthening of learning foundations in the early grades.

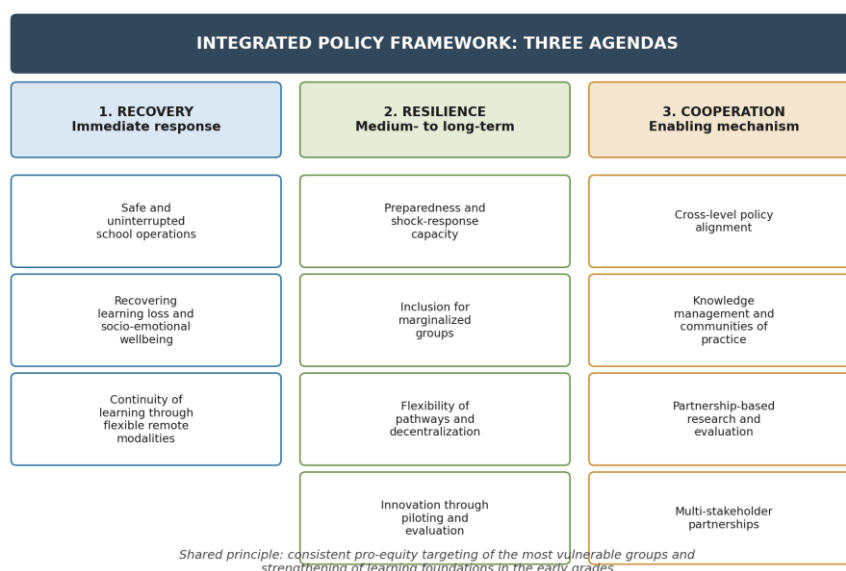


Figure 5. Integrated Policy Framework: Three Agendas

Source: author's synthesis adapting the ASEAN regional policy framework of the COVID-19 pandemic period [5]

The Learning Recovery Agenda as an Immediate Response

The recovery agenda rests on three pillars that secure continuity, restore losses, and safeguard the ongoing delivery of learning, all of which need to be pursued simultaneously. The first pillar secures safe and uninterrupted school operations, based on the principle that suspending in-person learning should be a last resort, given the substantial negative effects of closure on children's academic, physical, and psychological development. Operationalizing this pillar requires a clear strategic plan that guides when and how schools operate, based on data-driven responses coordinated with health authorities, cross-ministerial coordination mechanisms, and a phased, risk-based approach [13]. For Mojokerto City, this translates into the need for school-level preparedness protocols, school-readiness checklists, and a two-way risk communication strategy engaging families and the broader education community.

The second pillar addresses the recovery of learning loss and socio-emotional development, beginning with measuring that loss through holistic, classroom-level formative assessment covering literacy, numeracy, and socio-emotional competencies. Based on these results, schools deliver catch-up and remediation programs calibrated to

each student's level of learning loss. Teaching at the right level, that is, tailoring instruction to students' actual learning needs rather than forcing them through curriculum targets that exceed their current abilities, has proven to be the most effective strategy for mitigating learning loss [3], [15], while tutoring delivered by teachers or paraprofessionals consistently produces substantial positive effects [16]. This pillar also requires proactive dropout prevention through early-warning systems that monitor individual attendance and achievement, the availability of accredited and equivalent alternative education pathways, and a cross-sectoral welfare support package providing financial assistance, nutrition, psychosocial services, and protection from violence.

The third pillar secures the continuity of learning whenever in-person instruction is disrupted, through a range of flexible and equitable distance-learning modalities, with technology positioned to enrich teaching rather than replace it. Evidence shows that technology improves academic outcomes only when deployed as part of a deliberately designed intervention, for example to scale quality instruction, facilitate differentiated learning, and expand practice opportunities [17]. Closing the digital divide for marginalized populations, building teacher capacity in remote pedagogy, and providing structured support for parents are preconditions for success, and these need to proceed hand in hand with ensuring online safety and equipping students with digital literacy.

The Medium- to Long-Term Resilience Agenda

Whereas the recovery agenda addresses disruptions that have already occurred, the resilience agenda focuses on preparedness for disruptions yet to come, through four mutually reinforcing pillars. The preparedness pillar emphasizes readiness and shock-response capacity, centered on a multi-hazard education contingency plan that defines the learning delivery system for various closure scenarios, together with the corresponding learning modalities, recovery mechanisms, and assessment practices. This framework is supported by the establishment of mitigation task forces at the sub-national and school level, standard operating procedures accompanied by simulation exercises, and curriculum and assessment reforms that prepare 21st-century learners by fostering student agency, mainstreaming socio-emotional skills that have been shown to strengthen foundational skills and wellbeing [18], [19], and applying periodic formative assessment. Strengthening the capacity and wellbeing of education personnel through continuous professional development completes this pillar [20].

The inclusion pillar asserts equity for the most marginalized groups, recognizing that the education system cannot alone bear the rising burden of student welfare, and therefore requires integrated cross-sectoral policy in social protection, health services, child protection, and technology provision. This pillar calls for creating a safe and welcoming learning environment free from physical, sexual, and emotional violence, through positive discipline, a zero-tolerance policy toward violence implemented via a whole-school approach, and trained child-protection focal points in every school. The financing dimension occupies a central position through the principle of progressive universalism, directing public spending first toward lower education levels and toward

populations most disadvantaged by poverty, gender, disability, ethnicity, and remoteness. [21] International guidance recommends that education budgets constitute approximately 15 to 20 percent of total public expenditure, accompanied by needs-based financing mechanisms for schools in disadvantaged communities [22], all of which rests on the availability of disaggregated data.

The flexibility pillar promotes agility through diverse pathways and decentralization, through the development of evidence-based and equitable blended and distance-learning models. Technology is positioned to transform the core of teaching rather than merely to provide access to devices and the internet, since infrastructure provision without a corresponding pedagogical transformation has proven insufficient. Operationalizing this pillar requires assessing digital readiness across infrastructure, teachers, schools, and parents, a phased implementation plan that prioritizes vulnerable populations, and system consolidation that links formal, alternative, and privately managed education into a single framework allowing students to move seamlessly between pathways. On the governance dimension, flexibility is achieved through a balanced distribution of responsibility among national, sub-national, and school-level authorities, ensuring both autonomy and accountability simultaneously [23]. The innovation pillar, in turn, positions rigorously evaluated piloting as the pathway toward large-scale reform, so that innovations developed during a crisis period are not allowed to pass without being learned from, but are instead evaluated for effectiveness to determine which merit retention, adjustment, or scale-up, with rigorous impact evaluation serving as the instrument that ensures scale-up decisions are grounded in evidence of learning outcomes rather than assumption or program popularity [24].

The Cooperation and Partnership Agenda as an Enabling Mechanism

Neither of the two preceding agendas can be realized by a single locality acting in isolation. Because the original regional document addresses cooperation among member states, whereas this study is framed around the context of a single city government, its underlying principles are transposed into a multilevel governance logic, namely vertical alignment with provincial and central government and horizontal cooperation with other localities and non-government partners, as illustrated in Figure 6. Four strategic scopes of cooperation translate this need for interconnection into the dimensions of policy, knowledge, evidence, and resources.

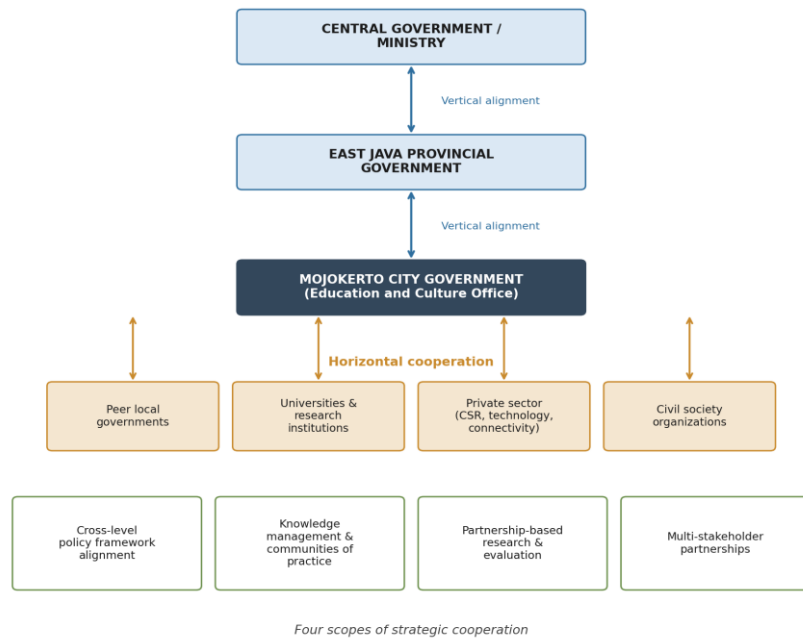


Figure 6. Multilevel Governance

Source: adaptation of ASEAN regional cooperation recommendations into a multilevel governance logic [5]

Cross-level policy framework alignment requires Mojokerto City to align its local education plans and policies with the policies of East Java Province and central government ministries, rather than formulating them in isolation. This alignment also extends to the use of large-scale assessment instruments as learning benchmarks; whereas the recommended instrument at the regional level is the Southeast Asia Primary Learning Metrics (SEA-PLM), at the national level in Indonesia the prevailing national assessment instrument can serve an equivalent benchmarking function to guide data-driven local policy [25]. Knowledge management and communities of practice are realized by strengthening cross-school teacher collaboration platforms, such as teacher working groups and subject-teacher forums, repositioned not merely as administrative gatherings but as genuine communities of practice that actively exchange effective teaching practices, and extended horizontally to peer localities so that innovations proven effective in one location can be adopted without repeating the learning process from the beginning.

Partnership-based research and evaluation requires forging cooperation with universities and research institutions to evaluate the effectiveness of remediation programs and learning innovations in a methodologically rigorous manner, so that local decision-making rests on tested evidence of outcomes while also opening access to expertise not always available within the local education bureaucracy. Multi-stakeholder partnerships, in turn, direct resource mobilization toward the local private sector through corporate social responsibility mechanisms, technology and connectivity providers, and civil society organizations; such partnerships not only add resources but also broaden the

relevance of education by bridging learning and the world of work, for instance through the provision of internship opportunities for senior secondary students.

3.5 Priority Policy Roadmap and Time-Horizon Considerations

The policy recommendations generated from the RRC framework are organized as a single integrated agenda spanning from immediate response to long-term investment, with a local needs assessment as the starting point underlying all of them, as summarized in Table 4.

Table 4. Integrated Priority Recommendation Roadmap by Policy Horizon

Horizon	Priority Actions	Key Drivers
Foundation (precedes all others)	Conduct a comprehensive needs assessment to empirically map the extent of learning loss, digital access inequality, and the distribution of dropout risk across schools from primary to senior secondary level.	Education Office, Regional Planning Agency
Immediate Response (Recovery)	Establish standardized classroom-level formative assessment (literacy, numeracy, socio-emotional); deliver remediation based on teaching at the right level, prioritizing early grades; operate an early-warning system for dropout prevention; integrate wellbeing and mental health services into the school ecosystem.	Education Office, Social Affairs Office, Health Office
Medium- to Long-Term (Resilience)	Develop a multi-hazard education contingency framework with mitigation task forces and simulation exercises; institutionalize inclusion as a quality standard (child protection, positive discipline, trained focal points); implement progressive universalism and needs-based financing; develop disaggregated data-based monitoring; pursue a phased innovation strategy with evaluation preceding scale-up.	Education Office, Regional Disaster Management Agency, Regional Planning Agency
Enabling Mechanism (Cooperation)	Align local policy with provincial and national policy and adopt the national assessment as a benchmark; strengthen teacher working groups/subject-teacher forums into learning communities; establish research partnerships with universities; develop multi-stakeholder partnerships (CSR, technology, internships); institutionalize horizontal coordination forums across localities.	Education Office, partner institutions

Source: author's synthesis based on the RRC framework adapted in Section 3.4

Capturing the demographic dividend requires distinguishing between two time horizons that are frequently conflated in the formulation of local education policy. Over the near to medium term, the demographic dividend is determined by the quality and

labor-market absorption of the cohort that has already entered, or is about to enter, the workforce, namely the currently expanding working-age population and secondary-level students who will soon complete their education. Over the long term, the sustainability of the dividend is determined by the quality of the learning foundation of children currently in basic education, who will not enter the workforce for roughly one and a half to two decades. Because the demographic dividend window in Mojokerto City is limited and is likely to narrow as population ageing intensifies, education policy needs to be positioned as a cross-horizon investment portfolio rather than a single choice between the basic and secondary levels. To capture the currently open window, the most relevant near- to medium-term leverage lies in strengthening secondary education, vocational education, and workforce skills, including dropout prevention and increasing participation at the senior secondary level, where the Net Enrollment Rate has in fact been declining. At the same time, strengthening the quality of learning foundations in the early grades remains a strategic long-term investment that safeguards the sustainability of human capital quality once the demographic window narrows, meaning that priorities at the basic and secondary levels do not cancel each other out but rather complement one another within a single, temporally coherent strategy.

The principle of pro-equity targeting for vulnerable groups is embedded throughout these recommendations, so that limited resources can be allocated progressively to the schools and students bearing the greatest burden of inequality. This approach is consistent with the logic of financing efficiency, since investment in learning foundations and dropout prevention is far less costly than remedying deficits that have already accumulated at higher levels. The three policy horizons proposed here are mutually reinforcing: short-term recovery without strengthened resilience remains fragile against future shocks, resilience without thorough recovery loses the very learning foundation it seeks to protect, and both, without cooperation, stall against the capacity limits of a single locality.

Discussion

Implementation Risk Mitigation

Implementing the proposed strategy carries a number of risks that need to be anticipated from the outset. The first risk stems from projection uncertainty, since the student figures for 2029 and 2034 were generated through simple linear regression, which is sensitive to fluctuations in historical data, such as the sharp rise and fall recorded during the pandemic period. Mitigating this risk requires periodic data updates, the use of comparative projection methods, and field validation prior to major investment decisions, so that projection results are treated as an indication of direction rather than as precise figures.

The second risk concerns the consequences of a declining student population at the basic education level, which may generate pressure toward school consolidation or restructuring and teacher redistribution. If not managed carefully, such measures risk

undermining equitable access and provoking social tension. The appropriate mitigation is to treat the declining student population as an opportunity to improve quality through an improved teacher-to-student ratio and strengthened instruction, rather than solely as a basis for downsizing, with restructuring carried out in a humane and participatory manner. The third risk is the continued decline of the NER at the secondary level, signaling unresolved problems of dropout and transition between education levels. Mitigating this risk involves operating an early-warning system based on attendance and achievement data, providing targeted assistance, and offering equivalent alternative education pathways.

The fourth risk concerns the management of cross-sectoral programs at the school level, particularly the implementation of the MBG program, as well as infrastructure disruptions such as power outages. For the MBG program, mitigation goes beyond scheduling alone; it requires integrating the program into the school day in a way that optimizes its nutritional and attendance benefits, through institutionalized coordination with program implementers and the health sector, together with scheduling protocols that protect effective learning time. For infrastructure disruption, mitigation rests on preparedness and the provision of backup learning modalities. Ultimately, all of these mitigation measures depend on a single shared precondition: well-functioning data governance and coordination among stakeholders.

CONCLUSION

Fundamental Finding : Mojokerto City stands at a demographic transition moment that opens a demographic dividend opportunity, but with a time window constrained by an intensifying trend of population ageing. Local data confirm that the region's education challenge has shifted: access at the basic education level has been effectively achieved, as shown by a primary NER of 100 percent, while the remaining challenge lies in learning quality and in participation and continuity at the secondary level, as reflected in the decline of the senior secondary NER to 71.5 percent and the projected shift in student numbers across levels through 2034. **Implication :** Based on these findings, this article concludes that the direction of basic and secondary education policy in Mojokerto City should rest on several conceptual propositions. Learning quality in the early grades is the most critical determinant of student success at subsequent levels, so recovery policy must prioritize strengthening learning foundations. Education system resilience requires proactive, evidence-based planning rather than reactive response, since building teacher and institutional capacity takes considerable time. Learning recovery, dropout prevention, and welfare assurance form a single, inseparable agenda. Cooperation, in turn, is the enabling mechanism that transforms the recovery and resilience agendas from policy formulations into concrete outcomes, since without cross-level alignment, knowledge management, research partnerships, and multi-stakeholder resource mobilization, even the best-designed policy risks stalling against the capacity limits of a single locality. The three agendas integrated within this

RRC framework should therefore be read as a coherent whole: recovery as the immediate step, resilience as the medium-term investment, and cooperation as the mechanism that makes both achievable. **Limitation** : As a limitation, this study relies on aggregate secondary data at the city level and on projections based on simple linear regression, and therefore does not capture variation across individual schools or the direct perspectives of stakeholders. **Future Research** : Further research is accordingly recommended to complement these findings with qualitative primary data, such as interviews and observation at the school level, to deepen the contextual understanding of the factors influencing secondary-level education participation, together with evaluative studies that empirically test the effectiveness of RRC framework implementation once it has been applied. For policymakers, the most pressing next step remains the comprehensive local needs assessment, to serve as the basis for measured, accountable, and evidence-based decision-making, alongside periodic updates of demographic and education data so that the proposed policy framework can continue to be adjusted to actual conditions on the ground.

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