
RESILIENCE IN BANGLADESH

Impact Evaluation of the Promoting Sustainable
Building in Bangladesh (PSBiB) Project

Effectiveness Review Series 2018/2019



Photo source: Author

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Collaborative Impact for OXFAM GB

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ABBREVIATIONS

AB	Alternative Blocks, which are alternative to the Traditional Bricks (TB) and semi-Sustainable Blocks (SSB)
ABTME	Alternative Building Technology Manufacturers and Entrepreneurs' Platform
BBMOA	Bangladesh Brick Manufacturing Owners Association
BELA	Bangladesh Environmental Lawyers Association
BNBC	Bangladesh National Building Code
BUET	Bangladesh University of Engineering and Technology
CPOM	Causal Process Observation Matrix
CSEB	Compressed Stabilized Earth Block
DDM	Department of Disaster Management
DoE	Department of Environment
DPW	Department of Public works
ER	Effectiveness Review
EU	European Union
FCK	Fixed Chimney Kiln
GHG	Greenhouse Gas
HBRI	Housing and Building Research Institute
HHK	Hybrid Hoffman Kiln
IAB	Architects of Bangladesh
IDEB	Institute of Diploma Engineers Bangladesh
IEB	Institution of Engineers of Bangladesh
IZZK	Improved ZigZag Kiln
JCF	Jagorani Chakra Foundation
KII	Key Informant Interview
LGED	Local Government & Engineering Department
M&E	Monitoring & Evaluation
MoA	Ministry of Agriculture
MoE	Ministry of Environment

MoH&PW	Ministry of Housing & Public Works
MSME	Micro, Small and Medium Enterprises
MSP	Multi-Stakeholder Platform
NHA	National Housing Authority
OGB	Oxfam Great Britain
Oxfam GB	Oxfam Great Britain
PIALA	Participatory Impact Assessment and Learning Approach
PSBiB	Promoting Sustainable Building in Bangladesh
SSI	Semi Structured Interview
ToC	Theory of Change

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Figure 1	PSBiB Project Theory of Change (ToC)
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Text Box 1	Project Targets



Source: Author

EXECUTIVE SUMMARY

Oxfam GB's Global Performance Framework is part of the organisation's effort to better understand and communicate its effectiveness, as well as enhance learning across the organisation. Under this Framework, a small number of completed or mature projects are randomly selected each year for an evaluation of their impact, known as an 'Effectiveness Review'. The evaluations focus on Oxfam's global thematic key areas, namely: 'livelihood enhancement', 'women's empowerment', 'resilience', 'sustainable water' and 'good governance'. The 'Promoting Sustainable Building in Bangladesh' (PSBiB) project was selected in 2018 for an Effectiveness Review (ER) in the area of 'resilience'.

The Project

The project aimed at reducing the negative impacts of the boom in the construction and house building industry in Bangladesh on the environment, livelihoods and communities, by enabling a transition from unsustainable Traditional Bricks (TB) to sustainable Alternative Building Blocks (AB). Drawing on the assumption that market incentives can lead to an effective and long-term transformation of the sector, the project worked to create the enabling policy environment at a national level through intensive advocacy and coalition building¹, and to initiate the market by raising user and consumer awareness about the benefits of ABs², while also strengthening producers' capacity for transitioning to AB production and managing associated risks³ locally. The project was implemented in three pilot subdistricts:

- Sadar and Manirampur in Jessore District (rural, southwest near the Indian border); and
- Savar in Dhaka District (suburban, northwest of the capital Dhaka, central).

The project was implemented from January 2016 until June 2019 with a total budget of € 2,000,000 (co-financed by EU SWITCH Asia for € 1,800,000 and Oxfam GB for € 200,000), together with three implementing partners: the Housing and Building Research Institute (HBRI), the Jagorani Chakra Foundation (JCF), and the Bangladesh Environmental Lawyers Association (BELA).

The Evaluation

The evaluation examined the effectiveness and relevance of the PSBiB project, with a focus on **policy changes** and **contributions to strengthening the country's resilience** during the three-year period under evaluation (from January 2016 until February 2019). The evaluation thus looked at policy changes and contributions to resilience in relation to context –*not* at performance against log frame targets.

The objectives were three-fold:

- To generate robust evidence of the effectiveness of the PSBiB project and its contributions to observed outcomes, while also assessing its relevance for building resilience;
- To draw lessons from the piloting of a sustainable brick value chain model for designing similar resilience building projects; and
- To provide useful inputs for expanding the way Oxfam conceptualises and evaluates impact on 'resilience' at different levels (from individual to national level).

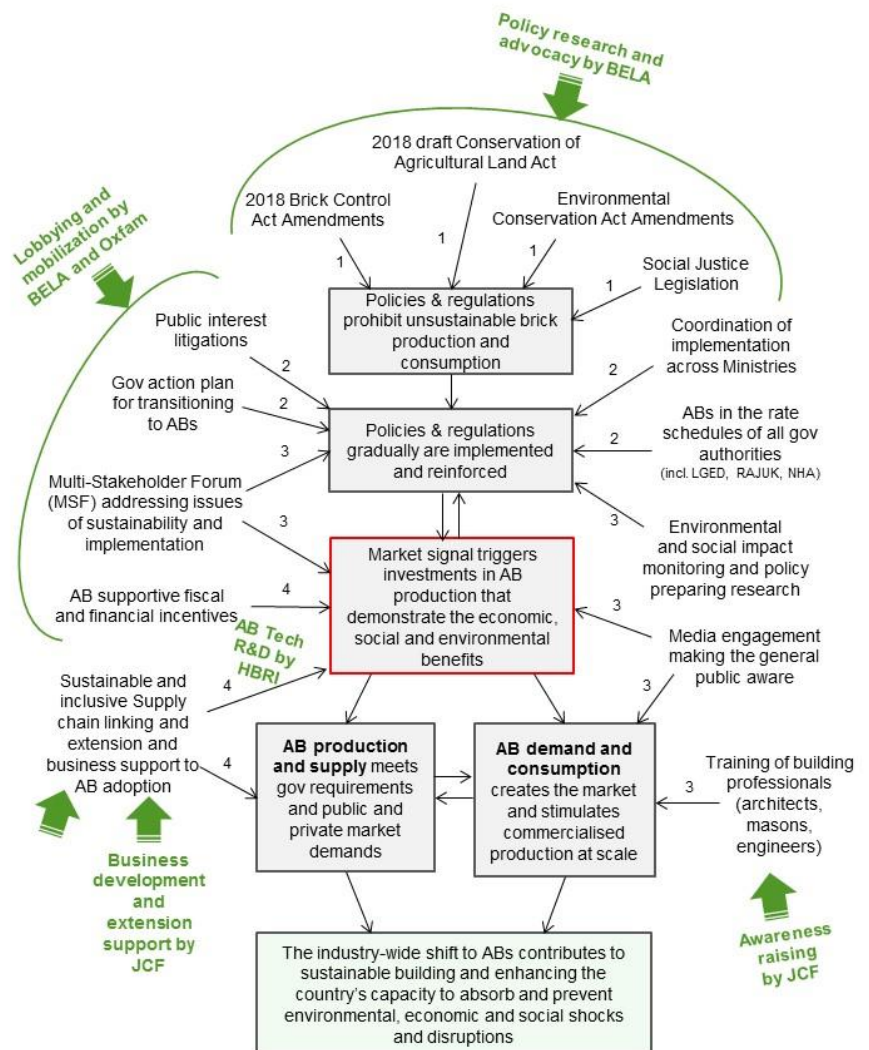
Contribution to policy change and influence towards achieving ‘whole system’ change cannot be assessed with the traditional counterfactual-based evaluation methods. As there is only one system, it is impossible to find valid comparisons and use statistical or experimental methods to assess the difference. A ‘realist’ and ‘transformative’ approach called PIALA (Participatory Impact Assessment and Learning Approach)⁴ was used to design and implement a fit-for-purpose evaluation that assesses ‘*contribution to change*’ in relation to ‘*context*’.

As part of the PIALA-based approach, the evaluation employed a method called Contribution Tracing to assess the project’s contribution to policy change and its relevance for building national ‘resilience’ alongside the project’s Theory of Change (ToC). Primary data was collected by conducting Semi-Structured Interviews (SSIs) with key stakeholders at the national level and in the project areas in Jessore District. This was then crosschecked with the secondary data obtained from the review of project and other relevant documents. Strength of evidence and contribution were scored for each level of change in the ToC to establish confidence in the findings. Preliminary findings from this analysis were cross-validated in a brief sense-making session with Oxfam in Bangladesh and the project partners.

Theory of Change (ToC)

For the purpose of this evaluation, the PSBiB project's Theory of Change was framed around the three interrelated 'capacities' of Oxfam's Resilience Framework (Jeans et al, 2016):

1. The *transformative* capacity of the institutions to achieve an effective and long-term transformation of the sector to more sustainable technologies and business practices;
2. The *adaptive* capacity of the brick industry to adopt sustainable technologies and business models that can prevent environmental, economic and social stresses and shocks; and
3. Its *absorptive* capacity to cope with stresses and shocks through inclusive supply chain linking and risk management strategies.



Contribution and Evidence Scores

Changes in Policies & Regulations (ToC links # 1)

Strength of Contribution Score 4 – Strength of Evidence Score 3.8

The project has been highly successful in influencing policies and regulations that prohibit unsustainable brick production and consumption and promote the use of alternative technologies. Achievements regarding the amendments made to relevant legislation are, given the challenging political context, timely and significant. They are the result of almost a decade's efforts by the partner BELA and the government Department of Environment, to which the PSBiB project has made a significant contribution by drawing attention to the issue of topsoil extraction and land degradation.



Market Signal (ToC links # 2)

Strength of Contribution Score 3 – Strength of Evidence Score 3.1

A strong momentum has been built by the project over the past two years towards creating the initial market trigger for AB investments, with clear indications of an emerging change in attitudes and practices among the stakeholders in Jessore district. The 2019 Brick Control Act amendments now enable the government to command and regulate the market transition to ABs. However, the evidence also clearly indicates that to have success, the government must lead by example and create the initial demand for ABs in public procurements –for which the project partly helped to create the conditions.



Changes in Transformative Capacity (ToC links # 3)

Strength of Contribution Score 3 – Strength of Evidence Score 3.7

First steps have been taken to build the capacity to transform the industry –e.g. through creating the Multi-Stakeholder Platform (MSP) that raises awareness and enables systemic learning among different stakeholders; engaging with policy research that helps to identify the gaps and weaknesses in the existing legislation; and through public interest litigations, campaigning and media events to make the general public aware of the necessity of protecting and strengthening the country's natural resources. Yet the project has not been able to institutionalise or consolidate these steps, or form the mechanisms that would allow them to continue after project closure –to accelerate the sector transformation towards more sustainable technologies and business practices.

Changes in Adaptive and Absorptive Capacity (ToC links # 4)

Strength of Contribution Score 2 – Strength of Evidence Score 3.5

A challenge for government authorities in transitioning to ABs in public construction works and creating the initial market, is the absence of a secured supply. While the project partners were able to prepare the technologies and raise awareness, time was too short to mobilise the political will and the resources for resolving the cost-benefit, supply chain linking and capacity issues that prevent producers (small and big) from adopting the new AB technologies.

Key Findings and Conclusions

Bangladesh has relatively weak institutions and law enforcement, and is known for its widespread corruption and general lack of accountability in public and private sectors, all closely linked to the country's short history of violent elitist power struggles.⁵ In this particular context, the evaluation found that the PSBiB project's strategies and interventions have been most significant and relevant in achieving the necessary **changes in policies and legislation** for promoting sustainable building materials and halting the extraction of topsoil from fertile land and protected areas. These changes were *conditional* to building the institutional and industry's capacity to transform the sector.

Amendments to the Brick Control Act were passed by Parliament in February 2019, and amendments to the Environment Conservation Act and a new Conservation of Agricultural Land Act are expected to be approved in 2019. These changes are achieved with clear and direct contribution from the project. The new legislation prohibits unsustainable brick production and consumption and promotes the use of alternative technologies that reduce pollution and prohibit the use of agricultural topsoil. Major strides have been taken regarding the inclusion of ABs in the government procurement schedules. With the new legislation coming into force during 2019, ABs will become mandatory in public sector construction works and thus more visible in smaller towns and suburban areas. This will help to create the initial market needed for producers to attract finance for investment in AB technologies. The evaluation found that the project's efforts to raise awareness and develop knowledge among building experts, brick manufacturers and the wider public, have significantly contributed in building the momentum towards a sector-wide transition to ABs.

While significant and highly necessary, the project's contributions have been insufficient in **triggering the market** and setting the transition process in motion. The evidence suggests that this will not take place before the new legislation comes into force in the course of 2019. The government will also have to set clear transitioning targets for both the public and the private sector, as well as including the necessary guidance in the National Building Code and creating fiscal incentives to make ABs more attractive. The target setting will depend on the 'readiness' of the technologies and the manufacturers to start the supply (i.e. **adaptive capacity**). The project partners were able to prepare the AB technologies and started promoting them in the project area and around the country. However, they did not succeed within the three-year period under evaluation to resolve the quality and supply chain-linking issues (i.e. **absorptive capacity**) that prevent manufacturers from adopting the new AB technologies.

Last, the project has made important but insufficient contributions to building the **transformative capacity** of Bangladesh's institutions –e.g. through creating the Multi-Stakeholder Platform (MSP) that raises awareness and enables systemic learning among the different stakeholders; engaging with policy research that helps to identify the gaps and weaknesses in the existing legislation; and through public interest litigations, campaigning and media events for making the general public aware of the necessity of protecting and strengthening the country's natural resource base. Considering Bangladesh's acute and augmenting climate vulnerability; the crucial role of its agricultural land for poverty reduction and food security; the limited capacity of its institutions to protect and manage its natural resource base and strengthen the country's resilience; the project was highly relevant and made important contributions in transforming the brick industry and increasing resilience. However, these contributions were insufficient in achieving and consolidating the desired change outcomes and in establishing the mechanisms that would sustain and accelerate the transformation process after project closure. This was partly due to contextual

factors (incl. the 2018 national elections) as well as research capacity issues (of the HBRI), which hampered and delayed the project's performance.

Another contributing factor was the project design. From a **Sustainable Development** perspective, the project would have benefitted from a more adequate time frame and a more holistic, flexible design to achieve transformative outcomes. Using a complexity-sensitive and adaptive management approach and methodology, grounded in a thorough context and power analysis, would have improved outcomes. Likewise, the project required a profound understanding of the challenges of turning a 400-year old industry with a short (localised) value chain into a long supply chain that uses modern technologies and requires advanced business capacities.

Given the country's climate vulnerability, arguably, the focus of international development support should be on strengthening the country's resilience, and in particular, the capacity of its institutions to protect and manage its land and natural resource base, rather than on reducing GHG emissions. It is tremendously important to build the transformative capacity of its institutions and the adaptive and absorptive capacity of its communities, sectors and industries to preserve, protect and strengthen the country's land and natural resource base.

Recommendations

Based on the findings and conclusions put forward in this report, the evaluation makes the following recommendations to Oxfam Bangladesh and its partners and donors:

1. Capitalise on the new legislation coming into force and the momentum built towards triggering the market by ensuring that the new legislation attracts ongoing media attention in the coming 1-2 years with national coverage. Media can play a crucial role in accelerating change. Enforcement of the new legislation will require ample media attention. Sustainable building and the use of ABs should be widely promoted by national media, making it a general people's agenda.
2. Build a coalition of international agencies that have an interest in continuing and/or funding the work of transforming the construction and house building industry –such as UNDP and the World Bank– to mobilise resources and attract impact investments in building the absorptive and adaptive capacity of the sector. This should be integrated from a strong social and economic justice perspective. Impact investments for solving the capacity and supply chain issues and establishing demonstration sites will be needed in at least three different parts of the country. This will allow for the pilot-testing and business modelling of AB production using different river soil materials. To encourage brickfield owners to shift their production to ABs and to manage the risks, supply chain linking and AB extension support will be required at a suitable scale to reach a large number of producers, traders, construction workers and consumers.
3. Obtain new funding to work with BELA and the DoE on consolidating and formalising the Multi-Stakeholder Platform (MSP), with a clear plan and strategy for the next three years to ensure that (among others):
 - the HBRI research on AB technologies and its AB material map is finalised;
 - the necessary guidance is developed and included in the National Building Code;
 - further amendments are made to the legislation to protect land and natural resources;
 - national policy dialogues are organised on a regular basis for addressing the problems that emerge in transitioning to ABs;

- a cross-ministerial coordination and regulatory authority is created that ensures good governance of both public and private construction and infrastructure works using sustainable materials; and
- MSP activities are also taken up by the districts.

The main purpose of the MSP would be to engage all relevant stakeholders in systemic learning and identifying suitable solutions that prevent further depletion of the country's land and resources, and to collaboratively monitor and adapt these solutions whenever new environmental and social sustainability threats or issues emerge.

4. For this evaluation to elicit critical debate and reflection, we recommend the Oxfam project team and partners organise a larger stakeholder sense-making event around the findings of this report. This will hopefully lead to stakeholders enacting these recommendations as they drive the transformative change process in Bangladesh after project closure.



Source: Author

1 INTRODUCTION

Oxfam GB's Global Performance Framework is part of the organisation's effort to better understand and communicate its effectiveness, as well as enhance learning across the organisation. Under this Framework, a small number of completed or mature projects are randomly selected each year for an evaluation of their impact, known as an 'Effectiveness Review'. These evaluations use reputable approaches and methods and focus on Oxfam's global thematic key areas, namely: 'livelihood enhancement', 'women's empowerment', 'resilience', 'sustainable water' and 'good governance'.

The '*Promoting Sustainable Building in Bangladesh*' (PSBiB) project was selected in 2018 for an Effectiveness Review in the area of **resilience**. The *Promoting Sustainable Building in Bangladesh* (PSBiB) project aimed to reduce the negative impacts of the boom in the construction and house building industry in Bangladesh on the environment, livelihoods and communities, by enabling a transition from unsustainable Traditional Bricks (TB) to sustainable Alternative Building Blocks (AB). The evaluation examined the effectiveness and relevance of the PSBiB project, with a focus on **policy change** and contributions to strengthening the country's **resilience** during the three-year period under evaluation (from January 2016 until February 2019). For the purpose of this evaluation, the PSBiB project's Theory of Change was framed around the three interrelated 'capacities' of Oxfam's Resilience Framework (Jeans et al, 2016).

The objectives of this evaluation were three-fold:

1. To generate robust evidence of the effectiveness of the PSBiB project and its contributions to observed outcomes, while also assessing its relevance for building resilience;
2. To draw lessons from the piloting of a sustainable brick value chain model for designing similar resilience building projects; and
3. To provide useful inputs for expanding the way Oxfam conceptualises and evaluates impact on 'resilience' at different levels (from the individual to the national level).

Meeting the first objective was important for assessing Oxfam's performance, and documenting whether and how outcomes have materialised towards achieving impact, as part of its Global Performance Framework. The second objective was considered important by Oxfam and partner colleagues in Bangladesh in order to learn "*what is the most strategic entry point to effectively trigger transformative system change*" in the political context of Bangladesh. The third objective, while not prioritised, responds to the increasing cross-cutting importance of resilience in Oxfam's development and humanitarian work. The evaluation was considered an opportunity for further exploring how to assess progress and contribution to impact on resilience at a national level, linking micro to macro level capacities to absorb, adapt and transform the system.

Oxfam uses a conventional counterfactual approach⁶ to assess impact at the micro level (i.e. communities, households and individuals). The PSBiB project necessitated a different approach suitable for assessing 'whole system change' leading to macro-level resilience –which is the 'upstream' contribution to impact.

Section 2 briefly describes the project's rationale and Theory of Change (ToC) and presents the visual model of the Theory of Change created and used for this evaluation. **Section 3** outlines the evaluation objectives, questions and methodology. **Section 4** presents the evaluation findings alongside the Theory of Change. **Section 5** summarises the key points made by the evaluation and concludes with a set of actionable recommendations. Included in the **Annexes** are: an

explanation to the framing of the Theory of Change around the resilience capacities; the guiding questions used for conducting the Semi-Structured Interviews; a list with all the stakeholders interviewed; and the process observation matrix integrating and linking all the data collected and harvested by the evaluation.

2 ABOUT THE PSBIB PROJECT

2.1 The Problem

Construction and brick production is a growing industry in Bangladesh, providing employment for about one million people. Bangladesh will need to construct approximately four million new houses annually to accommodate the growing population. Since Bangladesh does not have any stone aggregate, manufactured bricks and building blocks form the main building material for the country's construction industry. With the rapid economic and population growth, the construction sector is expected to further expand at the current rate of 8-9 percent annually. Since bricks constitute 44 percent of all construction materials, the demand for bricks is expected to grow at least 5.6 per cent per year.⁷

A 2014 study undertaken in six divisions in Bangladesh to investigate the CO₂ emissions from brickfields⁸, reveals that there are more than 45,000 brick kilns in Bangladesh which combined account for about 95% of operating kilns. Only about 7000 of these are registered. Most of the kilns use out-dated resources and energy intensive technologies. Over 90 percent use the traditional fixed chimney kiln (FCK). These technologies form one of the largest carbon-emitting sources in Bangladesh. Importantly, they are highly polluting for the environment and form an imminent threat to public health. They are also causing a rapid depletion of the country's fertile agricultural land and thus endangering the country's future food security.

Coal is used as the main fuel for burning in the kilns, while approximately 30 percent of brick kilns use firewood illegally. Over 2.2 million tons of coal and 1.9 million tons of firewood are consumed every year, contributing to aggravated deforestation and depletion of non-renewable fossil resources, while emitting 15 million tons of greenhouse gas (GHG) emissions annually.⁹ The brick burning affects the health of the workers on the brickfields –low wagedworkers from vulnerable groups (including women and children) who lack access to decent work or better livelihood opportunities. The brick kilns emit toxic fumes containing high concentrations of oxides of carbon and sulphur and suspended particles that are harmful to eyes, lungs and throat. The wind spreads the dust and carbon monoxide gas to nearby towns and villages, affecting the health of the surrounding communities. In Dhaka city, for instance, it is estimated that 38% of the fine particulate pollution comes from the brick industry.¹⁰

The brick manufacturers use a single raw material, clay, obtained from the topsoil of agricultural land. Landowners in need of cash sell their topsoil to the brickfields. Then, they either turn the land into ponds or wait for 6-7 years for it to become fertile again. If the land is situated at a higher altitude and excavated less than one meter deep, it may be turned into agricultural land after 3-5 years. Over 45,000 brickfields extract large amounts of fertile topsoil during 4-6 months every year. The 7,000 registered brick kilns alone consume over 1.27 billion cubic feet of topsoil from fertile arable land annually. About seven percent of the country's total land (13,391 km²) is experiencing

land degradation due to the extractions by the brick kilns, and this amount is only increasing. For a country such as Bangladesh, whose local economy and people heavily depend on agriculture for food and income, this has severely damaging effects and forms a direct threat to its climate resilience and its capacity to absorb and prevent environmental, economic, and social shocks and disruptions.¹¹

The Government of Bangladesh seems committed to combating unsustainable brick production. Its 2013 Brick Making and Kiln Establishment Act prohibits the use of polluting brick burning technologies and the establishment of brickfields in residential, protected, commercial and agricultural areas, and in forests, sanctuaries, wetlands and Ecological Critical Areas (ECAs). The Department of Environment banned traditional kilns and ordered their shutdown by June 2014. Heavy fines and prison sentences are imposed on violators. Consequently, the building industry is adopting less polluting technologies of brick and building block production (e.g. zigzag kilns, vertical shaft brick kilns, hybrid Hoffman kilns, and tunnel kilns). However, each of these solutions still use clay as raw material, extracted from surrounding agricultural lands, and emitting CO₂ from burning the clay. Additionally, more than 90 percent of the brickfields continue using the highly polluting and GHG-emitting fixed chimney kilns (FCK).

2.2 Project Summary

2.2.1 Objectives and Results Areas

The overall objective of the “*Promoting Sustainable Building in Bangladesh*” (PSBiB) project was to reduce the negative impacts of the boom in the construction and house building industry on environment, livelihoods and communities, by promoting building block manufacturing technologies that are clean, consume limited energy and resources, avoid using topsoil from agricultural land and have zero GHG emissions.

More specifically, the project sought to develop a model for shifting the production and consumption of fire-burned bricks made of clay from agricultural topsoil –called Traditional Bricks (TBs)– to heat-compressed building blocks using dredged river soil¹² –called Alternative Building Blocks (ABs). To this end, the project worked to:

- Create the **enabling policy environment** through intensive advocacy and coalition building (Results Area 3 in the project log frame);
- Initiate the **market** by raising user and consumer awareness about the benefits of using ABs (i.e. Result Area 1); and
- Strengthen **producers’ capacity** to transition to AB production and manage associated risks (i.e. Result Area 2).

2.2.2 Budget and Locations

In a period of three and a half years (from January 2016 until June 2019) and with a total budget of € 2,000,000 (co-financed by EU SWITCH Asia for € 1,800,000 and Oxfam GB for € 200,000), the project sought to pilot the model in three *upazilas* (or sub-districts) of two selective *zilas* (or districts)¹³ with among the highest density of brickfields that produce fire-burned bricks using the traditional fixed chimney kilns (FCK) technology. These were:

- The rural Sadar Upazila and Manirampur Upazila in **Jessore District**, in the southwest near the Indian border;
- The suburban Savar Upazila in **Dhaka District**, 24 kilometres to the northwest of the capital Dhaka in central Bangladesh.

2.2.3 Partners and Interventions

To deliver the project, Oxfam worked with three key partners implementing the following activities:

- The **Housing and Building Research Institute (HBRI)** was responsible for developing and promoting the alternative river soil-based technology countrywide. The HBRI is an autonomous organisation under the Ministry of Housing and Public Works (MHPW) that is headed by the MHPW Minister and runs by the allocation of Government grants. It is the only National Research Institute that is entrusted to conduct research on housing problems and innovations in construction materials, technologies and planning.
- The **Jagorani Chakra Foundation (JCF)** delivered all the AB trainings, business development and extension support services to architects, engineers, masons and producers in the local construction market of the two target districts. It also raised awareness among the local authorities and house builders regarding the benefits of the ABs. JCF is a Bangladeshi NGO and micro-finance institute that works on social development and women's empowerment. It is one of the biggest NGOs in Bangladesh with nearly 5000 employees and 500 offices in 37 districts and 2012 sub-districts, covering about half of the country. It's 2018-2019 budget is nearly US \$ 422,2 m.¹⁴
- The **Bangladesh Environmental Lawyers Association (BELA)** led on the advocacy and the analysis of relevant policies and legislation for helping the market transition to fully sustainable AB technologies. BELA is a national NGO of lawyers that conducts policy research and advocacy and raises public awareness to protect the environment and national resources in Bangladesh. BELA emphasizes citizen participation in law making and policy planning and pursues public interest litigations to achieve 'environmental justice' for the people and communities in the country. BELA engages with the government authorities and the non-governmental sector and has built a wide and credible reputation.

2.2.4 Logical Framework Targets

This evaluation was tasked to assess contribution to transformative change and resilience –not performance against log frame targets.¹⁵ Yet to understand the achievements in terms of project contribution, it is important to also understand the project design and ambitions that should have enabled these achievements.

The ambitions of the project were high, and given the context, unrealistic.¹⁶ Starting from zero, it aimed to increase AB consumption by 10 percent in the project area (Sadar and Manirampur in Jessore, and Savar in Dhaka) in less than three and a half years – drawing on:

- a 20 percent increase in awareness among the population of the economic, social and environmental benefits of ABs;
- 50 percent increase in the adoption of AB technologies by technical building experts (incl. architects, engineers, masons, educators); and
- 15 percent increase in the market share of eco-certified ABs.

From zero, the project also aimed to increase AB supply by 15 percent in the project area by enabling at least 15 micro, small and medium-sized enterprises (MSMEs) to effectively transition to AB production. These enterprises would then develop and disseminate successful business models, with 150 workers trained and women workers experiencing improvement in their working conditions.

Last, the project aimed to get at least one amended policy enacted that would trigger the market, by:

- raising the knowledge and awareness of at least 500 judicial and policy experts of the gaps in the existing legislation;
- promoting the adoption of ABs by government in at least three procurements for public construction works; and
- disseminating evidence on the feasibility and effective use of AB technologies.

2.3 Theory of Change (ToC)

The Theory of Change (ToC) of the PSBiB Project built on the assumption that market incentives can lead to an effective and long-term transformation of the brick industry in Bangladesh to more sustainable technologies and business practices, resulting in a significant reduction of GHG emissions, of deforestation and of land degradation.¹⁷ The hypothesis is that market incentives would help to create the AB demand and supply and enable the transition from TB to AB production, if:

1. adequate policies and regulations would be in place that effectively ban unsustainable brick production and consumption;
2. the government would set the example by applying the regulations to its own public building procurements.

Simply, the logic is as follows:



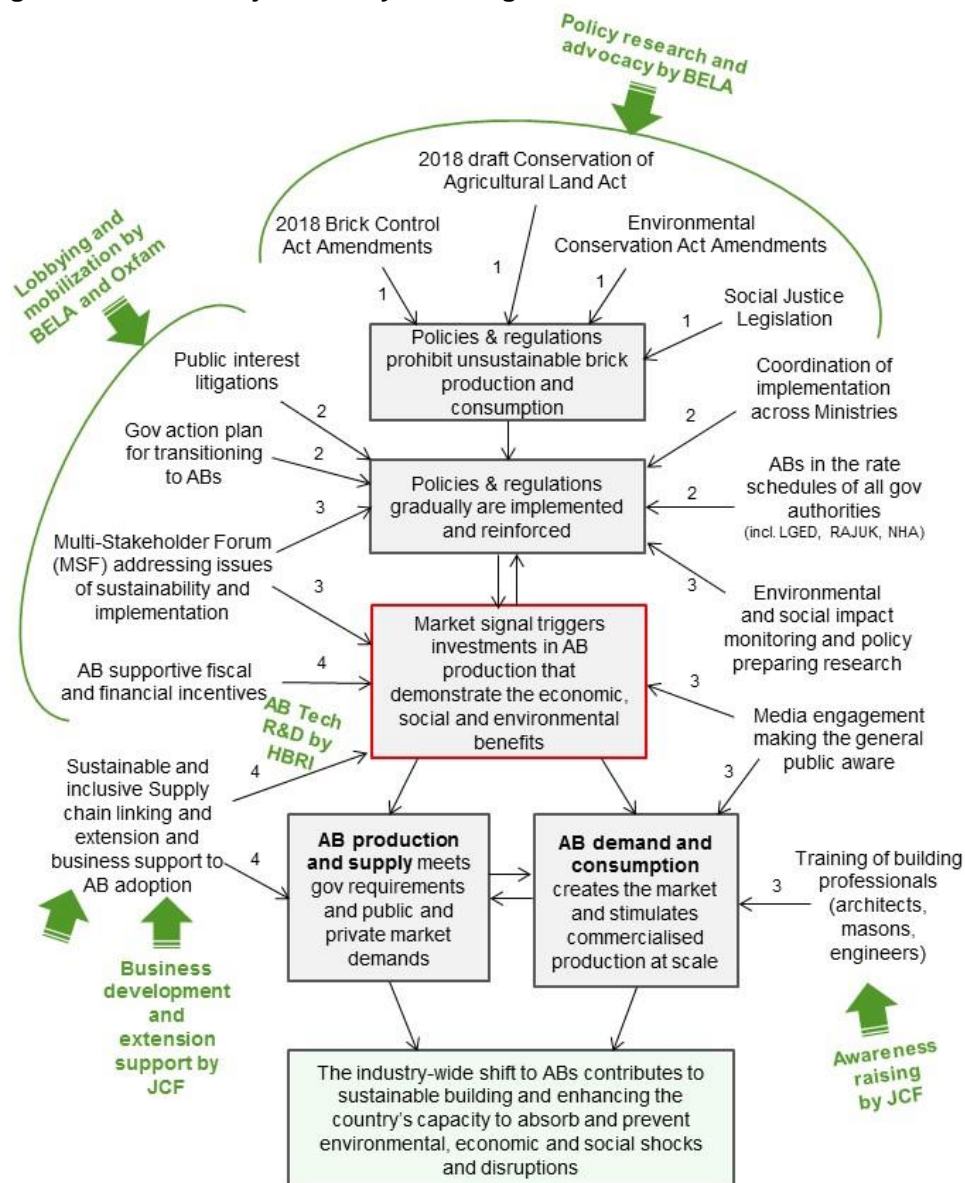
Furthermore, the transitioning from TB to AB production would also help to build the country's resilience at a national scale, by:

3. Strengthening the country's **capacity to transform** the industry by developing mechanisms for ongoing multi-stakeholder dialogue and learning, policy research, media engagement, and reinforcement of regulations;

4. Build the country's **capacity to absorb** and **adapt** to prevent future environmental, economic and social shocks and disruptions by developing an extension and support system that enable MSMEs to adopt the new AB technologies and business models¹⁸, and facilitate sustainable and inclusive supply chain linking.¹⁹

Market forces would then trigger and sustain the transformation of the industry and help to consolidate the country's acquired capacity to absorb and prevent environmental, economic and social shocks and disruptions. The diagram in **Figure 1** on the next page graphically presents the ToC that was constructed for the evaluation of the PSBiB Project based on a desk review of project documents and consultations with project staff and partners.²⁰ The numbers 1-4 in the diagram reflect the four elements 1-4 of the hypothesis described above.

Figure 1 – PSBiB Project Theory of Change



Source: Author.

3 ABOUT THE PSBiB EVALUATION

3.1 Focus

During the scoping for the evaluation²¹, Oxfam's Global Impact Evaluation team inquired into the project's 'evaluability'. Options were explored to assess the impact of the combined changes in national policy, local market, and local MSME capacity which were expected to enable the transition from TBs to ABs, on national and local level 'resilience'.

Due to delays in the research to produce the new AB technologies, much of the work at the local level that had been planned in the project's second year (2017), with MSMEs in particular, was postponed to the third year (2018). It was then further delayed by the national elections and seasonal brick production activities. Hence the outcomes of the work at the local level were largely premature and did not justify an investment in a medium sized impact inquiry at that level.²²

Second, as presented in the ToC in **Section 2.3**, change in the policy area had proven conditional to achieving change in the other results areas, and thus also conditional to building overall resilience both upstream (at the national institutional level) and downstream (in the local markets and the communities). Indeed, the mid-term evaluation report did draw attention to the importance of the changes required at the policy level, to enable further changes on the consumer and producer sides.

For these two reasons, it was agreed to focus the evaluation on the (intermediate) policy outcomes. This was the area where the project could have made significant progress, sufficient to be 'evaluable' from an impact pathway perspective.

3.2 Objectives

This evaluation was assigned to assess the effectiveness and relevance of the PSBiB project during the three-year period under evaluation (from January 2016 until February 2019), with a focus on: (a) policy changes; and (b) contributions to strengthening the country's resilience. The evaluation thus looked at policy changes and contributions to resilience in relation to context –*not* at performance against log frame targets.

The objectives of the evaluation were threefold:

1. First, the evaluation sought to generate robust evidence of the effectiveness of the PSBiB project and its contributions to observed outcomes, while also assessing its relevance for building resilience. Meeting the first objective served Oxfam GB's commitment to assess its global performance in the area of 'resilience', and thus document whether and how outcomes have materialised towards achieving impact, as part of its Global Performance Framework.²³
2. Second, it aimed to also draw lessons from the piloting of a sustainable brick value chain model for designing similar projects in the area of resilience. This was considered important by Oxfam and partner colleagues in Bangladesh in order to learn "*what is the most strategic entry point to effectively trigger transformative system change*" in the socio-economic and political context of Bangladesh.

3. Third, the purpose was also to expand the way Oxfam conceptualises and evaluates the impact of resilience building projects at different levels (from individual to national). Given the evaluation's limited budget and timeframe, this was not considered a priority. However, the expectation was that by using Oxfam's Resilience Framework for constructing the ToC²⁴, useful inputs could be provided into further developing its approach for impact assessment of resilience at a *national/institutional* level (complementary to its counterfactual approach used at the household and individual levels).²⁵

3.3 Questions

The main evaluation questions that the effectiveness review needed to answer were:

1. What has changed in terms of policies and regulations to prohibit unsustainable brick production and consumption?
2. How pertinent and effective were these changes for creating the desired market incentive that should lead to the transformation of the brick industry?
3. What explains the changes? What and who contributed to the changes? What supported or undermined the outcomes? What has the project's contribution been?
4. How relevant were the project interventions for building 'resilience'?

3.4 Design and Methodology

3.4.1 Overall Approach

Assessing the impact of policy change on resilience at a macro or national level requires a different approach than the counterfactual approach²⁶ used by Oxfam for assessing the impact of grassroots interventions on resilience at the micro or local level. Having only one national resilience system (n=1) makes it impossible to use statistical or experimental methods. Contribution to policy change towards achieving 'whole system' change cannot be assessed with conventional counterfactual-based evaluation methods.

To design and implement a fit-for-purpose evaluation, the effectiveness review used PIALA (Participatory Impact Assessment and learning Approach): a theory-based approach that draws mostly on 'realist' and 'transformative' evaluation traditions and is most suitable for evaluating system change and impact in contexts where conventional counterfactual approaches don't work well (e.g. due to high causal density, the absence of a valid baseline or point of comparison, or too small amounts of comparable cases).²⁷ PIALA assesses the mechanisms that enable (or undermine) observed changes in relation to the context and the wider system, and emphasizes the importance of participation for creating ownership of the evaluation among key stakeholders and generating more *robust* and *useful* findings that support transformative change.

3.4.2 Methods for Data Collection and Causal Analysis

PIALA consists of five methodological elements (systemic Theory of Change, multi-stage sampling, participatory mixed-methods, participatory sense-making, and configurational analysis) and a framework for adapting these elements to the specific evaluation context. It can embed a wide

range of data collection methodologies –from classic household statistics to participatory statistics, depending on the evaluation needs, focus and context. In contexts where the amount of comparable cases is small (e.g. n=3 or n=1), its configurational analysis is reduced to a contribution tracing method. If the affected populations in these cases are too small for statistical analysis, data is collected using only qualitative methods.

Given the focus in the evaluation of the PSBiB Project was on policy and resilience at a national level, there was only one case (n=1) with no ‘affected populations’. Hence the contribution tracing method was applied drawing only on qualitative data.²⁸ Contribution tracing is used alongside a systemic ToC and combines process tracing and contribution analysis²⁹ to observe and assess system change towards impact. It involved the following steps:

1. Reassembling of the presumed impact pathway followed in the ToC, by harvesting outcomes based on a desk review of project documentation and relevant publications (in journals, media and online) and on conversations with project staff and partners.
2. Assessing how and to what extent the outcomes have materialised, and what or who has contributed or hindered them, based on the collection of primary data from as many different sources as possible.
3. Comparing ‘evidence’ with ‘theory’ and probing for alternative explanations through systematic crosschecking of evidence from different sources for each causal relation in the ToC, and through cross-validating findings with partners and stakeholders.
4. Establishing confidence in the findings by scoring the relative strength of evidence and contribution for each causal relation in the ToC, and further strengthening the evidence until the best possible scores are achieved.

Primary data was collected by conducting Semi-Structured Interviews (SSIs) with over 40 key stakeholders at the national level and in the project areas in Jessore District.³⁰ The stakeholders were identified through a desk review of project and other relevant documents and conversations with implementing partners. The primary data was crosschecked with secondary data found in the documents reviewed. A Causal Process Observation Matrix (CPOM) was created in which evidence was collated alongside the ToC (see **Annex IV**). The CPOM was then used as the basis for crosschecking and scoring of evidence and contribution. The scores and the tools used to do the scoring are further detailed in **Section 4.2**.

3.4.3 Sense-making

Preliminary findings from this analysis were used as the basis for a brief sense-making session with Oxfam and partners. A three-hour workshop was organised at the end of ten days data collection. The workshop involved a facilitated discussion to cross-validate emerging findings regarding the observed changes, context and influences and project contributions, and to surface new insights that could further strengthen the evidence. The discussion was followed by a brief brainstorm around how to consolidate the outcomes within and beyond the remaining project period.

3.4.4 Limitations

The effectiveness review was characterised by a number of limitations that were mostly due to time and resource constraints.

First, primary inquiries were conducted with key stakeholders who mostly knew about the project, having been involved or at least informed in one way or another. The budget did not allow us to expand the range of stakeholder consultations to a broader cross-section of the construction sector and targeted communities. Positive bias was avoided by using the Contribution Tracing method that continuously probes for alternative viewpoints and countering critiques while scoring confidence in the emerging evidence.

To increase the confidence, we had originally planned to engage a second researcher to conduct additional interviews and independently cross-validate the findings from the initial inquiries. The plan failed due to *force majeure*: the Bangladeshi law consultant hired for the job resigned due to a family health threat, and three other selected candidates proved unable to do the work on short notice before final analysis (mid-April 2019).

As the focus of the evaluation was on the intermediate policy outcome level, and on the relevance of the PSBiB project for building country-level resilience, no grassroots level inquiry, and therefore, no grassroots stakeholder participation was required in the sense-making. The emphasis was on the learning and engagement of Oxfam and partners. However, for the evaluation to elicit critical debate and reflection for greater uptake of the recommendations, in particular, by the stakeholders who will need to continue driving the change process after project closure, it might be useful to organise a larger stakeholder sense-making event. A recommendation is formulated around this in **Section 5.2**.



Source: Author

4 EVALUATION FINDINGS

4.1 Understanding the Context

In order to appreciate the evaluation findings, it is essential to understand the political and economic context in which this project attempted to create the policy environment and market incentives for a shift to ABs within a relatively short time frame of 3.5 years. Bangladesh is known for its violent politics that feeds corruption and weakens law and governance. This made it challenging for the PSBiB Project to make significant contributions to real transformative change. Understanding the challenges helps appreciate the project's achievements.

4.1.1 Politics and Governance³¹

On 30 December 2018, general elections were held in Bangladesh, resulting in a landslide victory for the Awami League led by Sheikh Hasina. Marked by violence and claims of vote fraud, the elections represent the latest chapter of political violence in the country's brief history since independence 48 years ago. Bangladesh separated from Pakistan in 1971 after a bloody liberation war that has shaped the present political landscape. Since then, the country has alternated between fragile democracy and military rule with violence as a persistent feature, compounded by floods and famine disasters.³²

Hasina has managed to remain in power and create relative stability in the past two decades since she came to power in 1996. This enabled the country's economy to grow at an annual rate of more than 6%, despite disastrous floods in 1998 and 2004 and smaller ones in 1999, 2005, 2015 and 2017. However, analysts say that wealth is not spreading fast enough and that it has not translated into more resilient or transparent public institutions, deepening popular disquiet and augmenting the country's vulnerability to climate-related threats. Bangladesh continues to have weak institutions and a weak enforcement of law. The country is plagued by persistent corruption in the public and private sectors, closely linked to the culture of confrontational politics.³³

With politics being reduced to a violent battle between established elites over state power and resources aiming to 'win or lose it all', there is limited scope for peaceful opposition and civil society to represent people's voices and needs and perform checks on governance and transparency. Civil society is heavily politicised and neutralised through manipulation of state institutions. Activists are prosecuted, opposition agencies blocked and workers' attempts to unionise systematically undermined. *"Conflicts between and within political parties spill over into the public sector impeding substantial reform of state structures, progressive policymaking and the development of an enabling environment for strong leadership at different levels of government (...)."*³⁴

4.1.2 Economic Trends

Bangladesh attained the status of lower middle-income economy (LMIE) two years ago due to its fast-paced GDP growth, diversification of production and exports, the growing competitive strength of a number of sectors in the economy, high inflow of remittances and overall improved economic performance. The economic growth in Bangladesh is largely due to the garment industry, which makes up more than four fifths of Bangladesh's exports. Foreign direct investment has remained

low, due to poor infrastructure, corruption, policy uncertainty, as well as lingering concerns about the country's politics. Nevertheless, poverty rates have fallen and the country's GDP has grown by 150% in the past decade.³⁵

Agriculture and the rural economy have been (and still are) a powerful driver of poverty reduction. Approximately 90 percent of the poverty reduction between 2005 and 2010 is attributable to agriculture. Moreover, agricultural productivity growth in Bangladesh at an average rate of 2.7 percent per year (this is one of the fastest growth rates in the world since 1995, second to China) has helped the country to make commendable progress in achieving food security over the past 40 years, despite frequent natural disasters and population growth.³⁶ Although manufacturing and services are increasing in importance, almost half of all Bangladeshi workers (and two-thirds of those living in rural areas) are employed in agriculture. With more than 70 percent of the population living in rural areas, about 87 percent of rural households partly or entirely depend on agriculture for their income.

“Despite being responsible for only 0.3 percent of the emissions that cause global warming, Bangladesh is near the top of the Global Climate Risk Index, a ranking of 183 countries and territories most vulnerable to climate change. When scientists and researchers predict how global warming will affect populations, they usually use 20- and 50-year trajectories. For Bangladesh, the effects of climate change are happening now. Cyclones are growing stronger as temperatures rise and are occurring with more frequency.”

(Frazzetta, The NY Times, 11 April 2019)

The construction and building sector is booming as a result of the rapid economic and population growth and is expected to expand at the current rate of 8-9 percent annually. Bangladesh will need to construct approximately four million new houses annually to accommodate the growing population. Government plans for infrastructure development require investments in building materials. As Bangladesh does not have any stone aggregate, manufactured bricks and building blocks form the main building material for the country's constructions and buildings, and thus are a fast growing industry.³⁷ In particular, brick factories have grown into a new economic power that has an influence on state politics.³⁸ However, traditional brick production using agricultural topsoil will be prohibited and sanctioned under the recent legislative changes³⁹. This will pave the way for investment and growth of alternative building materials that are entirely sustainable, and at the same time, economically more beneficial.

4.1.3 Climate Vulnerability

Bangladesh is an almost entirely flat and low-lying (around sea level) country that is among the world's most densely populated and most vulnerable to climate change. Climate change poses both a short and a long-term threat to the country's agricultural sector, particularly in areas affected by upstream flooding (Central to North), tidal surge and saline intrusion (coastal areas in the South)⁴⁰ and unseasonal drought (mostly to the Northwest).

Every year Bangladesh experiences regular natural floods, which are beneficial to agricultural growth. The floods replace artificial irrigation and fertilise the fields by bringing sediments from upstream and washing away the salt deposited on the fields from evaporation. The benefits of flooding are clear in El Niño years. However, as El Niño becomes increasingly frequent, and flood events become more extreme due to climate change, there is a growing risk of drought or devastating floods following the monsoons. Moreover, as the Himalayan ice melts, a densely

populated and riverine downstream country such as Bangladesh is at risk of a severe water crisis *within* the next 20-30 years and of ever increasing droughts and floods.⁴¹ Preparing for this likely scenario –the impact of which has already been felt– requires the government to carefully consider how to prevent further depletion of its natural resources, and how to restore and strengthen its land and water sources wherever possible.

4.2 Contribution and Evidence Scores

Table 1 below presents an overview of the evaluation’s findings and corresponding contribution and evidence scores for each level of change in the Theory of Change, which are further explained and substantiated in **Section 4.3**.

Contribution scores are different from conventional performance scores. They don’t mark how well interventions have performed against predetermined targets (which is what performance scores do); rather they signify the relative strength of ‘contribution’ made at each level in the Theory of Change, which may or may not have been caused by project performance. It helps to value project achievements relative the other influences at play in complex and politicised contexts such as Bangladesh.

In this evaluation, we used a simple scale of four contribution scores:

Contribution Score 4 (Very Strong)	The contributions made were absolutely necessary and sufficient to generate the outcomes and impact, and the outcomes were highly satisfactory, given the context and conditions and the investments made.
Contribution Score 3 (Relatively Strong)	The contributions made were absolutely necessary but insufficient to generate the outcomes and impact. Better performance or other contributing causes were needed to help generate satisfactory outcomes.
Contribution Score 2 (Relatively Weak)	The contributions made were of medium importance and insufficient to generate the outcomes and impact. Better performance as well as other mechanisms were needed to generate the desired results.
Contribution Score 1 (Very Weak)	The contributions made were weak and largely insufficient to generate meaningful outcomes and impact.

The evidence scores in Table 1 present the averages of the scoring of our confidence in the evidence strings⁴² that must support the findings and justify the contribution scores. They draw on two criteria:

- **Evidence sufficiency:** There is enough evidence in terms of quantity and inclusiveness for making a sound judgement about the causal relation;
- **Evidence reliability:** A similar inquiry would likely produce the same evidence. Different sources and viewpoints confirm each other.

The overall rule is that the evidence needs to be based on a minimum of two independent and relevant sources, and supported by verifiable project documents or relevant secondary data, in order to be found reasonably reliable. A simple scale of four evidence scores was used:

Evidence Score 4 (Very Strong)	The evidence is sufficient and reliable.
Evidence Score 3 (Relatively Strong)	The evidence is reliable and almost sufficient.
Evidence Score 2 (Relatively Weak)	The evidence is not entirely reliable yet (almost) sufficient.
Evidence Score 1 (Very Weak)	The evidence is insufficient and unreliable.

Table 1 – Contribution and Evidence Scores

Theory of Change	Scores		Key Findings
	Strength of Contribution	Strength of Evidence	
Changes in policies & regulations (links # 1)	4 Absolutely necessary and sufficient (outcomes were highly satisfactory, given the context and investments made)	3.8 Confidence scores: 4, 4, 4, 3, 4.	The contributions made by the PSBiB Project were highly satisfactory, and given the context, absolutely necessary and sufficient to generate the desired changes in policies and legislation. The project has been highly successful in influencing policies and regulations that prohibit unsustainable brick production and consumption and promote the use of alternative technologies. Achievements regarding the amendments made to relevant legislation are, given the challenging political context, timely and significant. They are the result of almost a decade's efforts by the partner BELA and the government Department of Environment, to which the PSBiB project has made a significant contribution by drawing attention to the issue of topsoil extraction and land degradation.

Table 1 (Continued) – Contribution and Evidence Scores

Theory of Change	Scores		Key Findings
	Strength of Contribution	Strength of Evidence	
Market Signal (links # 2)	3 Absolutely necessary but insufficient (better performance or other contributing causes needed to generate satisfactory outcomes)	3.1 Confidence scores: 2, 3, 4, 4, 4, 2, 3.	The contributions made by the PSBiB Project were necessary but insufficient in generating the desired market signal. Other contributing causes are needed. A strong momentum has been built by the project over the past two years towards creating the initial market trigger for AB investments, with clear indications of an emerging change in attitudes and practices among the stakeholders in Jessore district. The 2019 Brick Control Act amendments now enable the government to command and regulate the market transition to ABs. However, the evidence also clearly indicates that, to have success, the government must lead by example and create the initial demand for ABs in public procurements –for which the project partly helped to create the conditions.
Changes in transformative capacity (links # 3)	3 Absolutely necessary but insufficient (better performance or other contributing causes needed to generate satisfactory outcomes)	3.7 Confidence scores: 4, 4, 4, 3, 3, 4.	The contributions made by the PSBiB Project were necessary but insufficient to generate the desired market signal. Further efforts are required to meet this objective. First steps have been taken to build the capacity to transform the industry – e.g. through creating the Multi-Stakeholder Platform (MSP) that raises awareness and enables systemic learning among different stakeholders; engaging with policy research that helps to identify the gaps and weaknesses in the existing legislation; and through public interest litigations, campaigning and media events to make the general public aware of the necessity of protecting and strengthening the country's natural resources. Yet the project has not been able to institutionalise or consolidate these steps, or form the mechanisms that would allow them to continue after project closure –to accelerate the sector transformation towards more sustainable technologies and business practices.
Changes in adaptive & absorptive capacity (links # 4)	2 Medium relevant and insufficient (better performance as well as other mechanisms needed to achieve satisfactory results)	3.5 Confidence scores: 3, 4, 4, 4, 3, 3.	The contributions made by the PSBiB Project were mediocre and insufficient to generate the desired changes in adaptive and absorptive capacity. A challenge for government authorities in transitioning to ABs in public construction works and creating the initial market is the absence of a secured supply. While the project partners were able to prepare the technologies and raise awareness, time was too short to mobilise the political will and the resources for resolving the cost-benefit, supply chain linking and capacity issues that prevent producers (small and big) from adopting the new AB technologies.

4.3 Evidence and Explanations

4.3.1 Changes in Policies & Regulations (links # 1 in the ToC)

The contributions made by the PSBiB Project were highly satisfactory, and given the context, absolutely necessary and sufficient to generate the desired changes in policies and legislation. The project has been highly successful in influencing policies and regulations that prohibit unsustainable brick production and consumption and promote the use of alternative technologies. Achievements regarding the amendments made to relevant legislation are, given the challenging political context, timely and significant. They are the result of almost a decade's efforts by the partner BELA and the government Department of Environment, to which the PSBiB project has made a significant contribution by drawing the attention to the issue of topsoil extraction and land degradation.

Contribution Score 4 – Absolutely necessary and sufficient

Evidence Score 3.8 – Quite strong, reliable and largely sufficient evidence

The project has been successful in its policy advocacy work. Positive and direct outcomes from the work of the Bangladesh Environmental Lawyers Association (BELA) as part of the PSBiB project were achieved with the Department of Environment (DoE) on:

- the amendment of the Brick Control Act (approved and passed by parliament);
- the amendment of the Environment Conservation Act (awaiting approval); and
- the drafting of a new Conservation of Agricultural Land Act (awaiting approval).

The new amended **2019 Brick Manufacture and Brick Kiln Installation Act**, in short the **Brick Control Act** (with nine Amendments to the former 2013 Brick Control Act), proposed by the Environment, Forest and Climate Change Minister Md Shahab Uddin, was the first bill passed by the 11th parliament in 2019.⁴³

The project had begun by creating a **Multi-Stakeholder Platform (MSP)** that would serve as a pressure group for policy reform. The expectation was that the MSP would develop and implement an advocacy strategy based on the members' assessment of the situation. At the early pre-policy stage, it was meant to function as an activist or working group and not yet as an established policy advisory group. It proved quite challenging to mobilise the different stakeholders (in particular the government agencies) to engage in the MSP within the challenging political context of Bangladesh and the upcoming national elections in 2018 (see **Section 4.1**). At the start there was a general lack of interest in the topic, as many government and parliament members have vested business interests in the brick industry, and architects and banks were preoccupied with matters considered more urgent than sustainable building materials. Hence the MSP started pursuing its lobbying on an individual basis. Alliances were built with influential individuals in the government (incl. the director of the DoE) and leading actors in relevant professional institutes (e.g. the head of the Institute of Architects Bangladesh, former secretary of the DoE). Awareness was raised about the benefits of ABs among construction and house building professionals by HBRI and BELA at the national level and by JCF and HBRI at the sub-national level.⁴⁴

Multiple dialogues and meetings were organised in the course of 2016-2017 with policy-making and other key stakeholders –including the Institute of Architects Bangladesh (IAB), Institute of Engineers Bangladesh (IEB), Bangladesh Institute of Planners (BIP), Public Works Department (PWD) and Department of Architecture (DoAr)– to discuss the policy gaps and scope for revision. Through these alliance building events the project gained a high profile at the different Government Ministries and Departments, and in particular, made a strong impression at the Ministries of Agriculture (MoA), Environment (MoEF) and Public Works (MoHPW). The project was able to secure a seat at the table of the inter-ministerial meeting organised by the Ministry of Environment and Forest on 4 July 2017, at which BELA presented its recommendations for the amendment of the Brick Control Act. BELA shared its recommendations officially on 11 July 2017, and the ministry organised an internal meeting on the final draft Amendment on 27 August 2017. The most relevant of BELA's inputs was the recognition of the issue of land degradation due to the use of topsoil by the brick industry.

BELA has been advocating for sustainable building practices since 2001 and was also involved in the UNDP project that, starting in 2010, promoted emission-reducing “green block” technologies such as Hybrid Hoffman Kiln (HHK) and Zig-Zag Kilns (ZZK). These “green block” kilns and technologies are more efficient in terms of their coal usage, yet they still use agricultural topsoil as the single raw material, and therefore, continue depleting agricultural land. Also, they require large investments or loans and advanced business capacity.⁴⁵ Land loss is one of the country's biggest concerns. With two percent of world population, Bangladesh produces only 0.5 ton per capita GHG, or 0.3 percent of the global GHG emissions (which is far below the global emission average). Yet, the country ranked in 2018 as the 7th most climate vulnerable and impacted country in the world, which due to rising sea levels will lose considerable parts of land.⁴⁶ Under the 2019 amended Brick Control Act combined with the new Conservation of Agricultural Land Act, technologies using topsoil will not be considered sustainable and will be forbidden.⁴⁷

Since the 2019 Brick Control Act amendments did not change the definition of agricultural land, the ambiguity around whether single-crop land should be considered as agricultural land is unresolved. According to the DoE, single-crop land comprises substantial parts of the country that could easily be upgraded to multi-crop agricultural land. With inputs from BELA, a new **Conservation of Agricultural Land Act** was drafted to clarify what is considered agricultural land and to protect agricultural land from industrial use. Moreover, amendments were made to the **Environmental Conservation Act** that determine the agricultural and natural resource conservation areas unsuitable for industrial use. The new Act and amendments are to be approved by the cabinet in the course of 2019. According to BELA, many more amendments are needed to ensure coherence in the existing legislation and regulations, but the present changes are the most essential in stopping unsustainable brick production and enabling a transition to ABs.⁴⁸

4.3.2 Market Signal (links # 2 in the ToC)

The contributions made by the PSBiB Project were necessary but insufficient in generating the desired market signal. Other contributing causes are needed. A strong momentum has been built by the project over the past two years towards creating the initial market trigger for AB investments, with clear indications of an emerging change in attitudes and practices among the stakeholders in Jessore district. The 2019 Brick Control Act amendments now enable the government to command and regulate the market transition to ABs. However, the evidence also clearly indicates that, to have success, the government must lead by example and create the initial demand for ABs in public procurements –for which the project partly helped to create the conditions.

Contribution Score 3 – Absolutely necessary but insufficient

Evidence Score 3.1 – Relatively strong, reliable and nearly sufficient evidence

Producers around the country, including those interviewed for this evaluation in Jessore, are aware that topsoil clay as a raw material for brick production is not sustainable, that policies are changing, and in time, they will have to transition to ABs. Reportedly, producers were made aware of this through the national Multi-Stakeholder Platform (MSP) that was established by the PSBiB project, and through the HBRI that is the government's national research institute on house building and construction materials, and a key partner in the PSBiB project.⁴⁹

The evidence also shows an emerging change in attitudes and practices among the stakeholders in Jessore district: the municipality started using ABs since the Public Works Department (PWD) included ABs in its rate schedule; some house builders followed the example; and some new entrepreneurs started AB production. People in the communities learn about the benefits of ABs from these pioneers. The project's third monitoring report confirms that among regular consumers there is an increased awareness around the benefits of using ABs, but that many are waiting to see the results achieved by the early adopters. Local Government and Engineering Department (LGED) engineers interviewed in Jessore estimate that 10 percent of the local population is aware of the new AB technologies. The project's last MEL study conducted in 2018 found that nearly 63 percent of the survey respondents (n=384) in the targeted area (Jessore and Dhaka Districts) know about ABs, with 74 percent also planning to use ABs. Overall, 8.9 percent had already used ABs in the construction of their houses: 9.5 percent in Dhaka district (n=144) and 8.6 percent in Jessore (n=235).⁵⁰

Many organisations have contributed in building the momentum towards creating the initial market trigger. The project's major contribution has been raising public awareness, the capacity building of producers, masons and engineers and the policy influence. The **district-level Multi-Stakeholder Platform (MSP)** set up by the project in Jessore engaged masons, government officials, brick field owners, engineers and other district-level stakeholders in joint discussions every 2-3 months around the negative impacts of TBs and the positive benefits of ABs and around the proposed changes in legislation.⁵¹

Members of the Bangladesh Brick Manufacturing Owners Association (BBMOA) claim to be ready for AB production. However, they remain resistant to the implementation of the 2019 Brick Control Act amendments as long as they risk losing a profit. The BBMOA has a market monopoly and

forms a powerful lobby in parliament as it represents the interests of PM and government members who, directly or indirectly, have a vested interest in the brick industry. A strong market incentive is required to enable members of the BBMOA to transition to ABs without risk. As the leading consumer of bricks and building blocks (40-50 percent), the government will have to create the initial market by shifting to ABs in its public construction works. The use of ABs in government buildings would help demonstrate and convince the private user and consumer market of the quality and benefits of ABs.⁵²

Major progress has been made in promoting ABs in public building procurements by the inclusion of 18 sustainable building block types in the **2018 Rates Schedule** of the Public Works Department (PWD). However, the ABs still need to be included in the Rate Schedules of other government departments that are involved in public procurement –in particular: the National Housing Authority (NHA) that is responsible for the licensing of house building; the Capital Development Authority (RAJUK) responsible for public infrastructure and buildings in the capital district; and most importantly, the Local Government and Engineering Department (LGED) that is responsible for local inter-district public construction works.⁵³ Including ABs in their Rate Schedules will enforce the use of ABs in all public building procurements and promote ABs in the smaller towns and suburban areas.⁵⁴

Learning from neighbouring countries such as Nepal, India and Pakistan that have already made the switch, the transitioning process is not expected to be overly difficult. Yet an immediate and total transition to ABs is not considered feasible, as this would effectively bring the supply of building materials and public construction works to a halt. To allow a phased transitioning process, the DoE is drafting an **action plan** with gradual transition targets (15% by 2020, 25% by 2021 and 40% by 2022...) for the public sector. A similar plan with aligned targets (e.g. 20% by 2020) will also be drafted for the private sector.⁵⁵ Crucially, a strong **political commitment** is needed to enable the transition. However, the Roads Transport and Highway Division (RT&HD) has started using more bricks in road construction since July 2018, as it minimises cost. Road constructions require large amounts of stone chips, and the cheapest available are brick chips. This clearly creates a negative market signal.⁵⁶

4.3.3 Changes in Transformative Capacity (links # 3 in the ToC)

The contributions made by the PSBiB Project were necessary but insufficient to generate the desired market signal. Further efforts are required to meet this objective. First steps have been taken to build the capacity to transform the industry –e.g. through creating the Multi-Stakeholder Platform (MSP) that raises awareness and enables systemic learning among different stakeholders; engaging with policy research that helps to identify the gaps and weaknesses in the existing legislation; and through public interest litigations, campaigning and media events to make the general public aware of the necessity of protecting and strengthening the country's natural resources. Yet the project has not been able to institutionalise or consolidate these steps, or form the mechanisms that would allow them to continue after project closure –to accelerate the sector transformation towards more sustainable technologies and business practices.

Contribution Score 3 – Absolutely necessary but insufficient

Evidence Score 3.7 – Relatively strong, reliable and nearly sufficient evidence

Through alliance building efforts, stakeholder meetings and policy dialogues, the **Multi-Stakeholder Platform (MSP)** at the national level started to yield positive results. The proceedings of the dialogues and meetings were sent to all the ministries and departments. Stakeholders acknowledge the value of this Platform moving forward to transform the construction sector. The MSP is considered essential for organising the national policy dialogues that will be needed (more than ever before) to address problems during the transition of the private and public construction market to ABs. Also, to develop the necessary support and incentives for the producers and consumers to adhere to the new regulations and to mitigate land loss. As the MSP convener and former HBRI director noted: “*After the project ends, who will raise the sustainability issues and raise the bar for ensuring the transformation of the sector into a truly sustainable industry?*” Hence government stakeholders plead for an expansion and formalisation of the MSP, to be hosted and facilitated, perhaps by the DoE. Its main purpose would be to engage all relevant stakeholders (including universities, professional institutions, the BBMOA, Bangladesh Bank, ADB, World Bank, etc.) in systemic learning and finding solutions to prevent the country's depletion of land and resources, and collaboratively monitor and adapt these solutions whenever new environmental threats or issues emerge. Formalisation would imply: a distinct vision and mission, a focused strategy, formal membership, secured funding, a formal bank account and an institutional host and secretariat. The main purpose would be to facilitate systemic learning.⁵⁷

The project has targeted government officials at Upazila level to raise awareness and promote ABs but seems to have somewhat overlooked the all-encompassing role of the DC in its jurisdiction. The DC as head of the civil administration of any district can play an important role in efforts to reduce environmental degradation as well as promoting ABs. Lobbying with the DCs is likely to be effective in reducing irregular licensing and switching to ABs in public construction works. There are regular (monthly plus need-based) district committee meetings, multi-stakeholder coordination meetings (incl. government and civil society) and building and environment meetings. However, ABs have not yet been discussed at these meetings. It is believed that once the 2019 Brick Control Act amendments come into force, ABs will be on all district meeting agendas. Integrating the project's MSP activities into these district meetings might help to consolidate it as a mechanism for

system learning and problem solving around sustainable building, involving all key stakeholders in the districts.⁵⁸

When the 2019 Brick Control Act amendments are enacted, most brickfields will become illegal. Capacity will be needed on the part of the District Offices and district-level DoE authorities to inspect all brickfields and dismantle those breaking the law. No more site and technology clearances will be required from the DoE for the licensing of new brickfields. For the new AB manufacturers, DoE clearance will be needed only for the raw material sourcing, saving time and resources. Notably, new environmental risks may emerge that will need to be carefully monitored and regulated, at both national and districts levels. River erosion, increasing the risk of large floods caused by extreme weather patterns, may occur when river soil is dredged in large quantities and concentrated ways. This will require further research and monitoring. Other issues that require ongoing research, regulation and monitoring will likely emerge during and after the transition. An institutional mechanism is necessary to organise environmental impact monitoring and policy preparing research on an ongoing basis. No provision has been made in the project design, however, to develop such a mechanism.⁵⁹

Likewise, social risks will also need to be researched and monitored. There were concerns that the shift to ABs may lead to unemployment of brickfield labourers due to an increased use of machinery replacing the labourers. This was not within the focus of the evaluation, but from the anecdotal data obtained in interviews with the TB/AB producers in Jessore, it would appear that this will only affect a small number of labourers. The production will expand over the entire year and increase significantly, creating more work. Whereas most of the TB brickfields workers are seasonal (e.g. for collecting the topsoil only in the dry season during 4-6 months per year), in AB factories they will be employed full-time and enjoy greater job security with less health and financial risks and less risk of physical accidents. Seasonal workers in TB brickfields take loans from the brickfield owners in the off-season to survive and feed their family, they are often unable to repay their debts with the income⁶⁰ from the high season's work. Child and bonded labour is common practice in the brickfields. People on average work no longer than 10-15 years in the TB brickfields before their health deteriorates. In AB factories, people would presumably work much longer. A small number (estimated at maximum 20 percent) of jobs may disappear in the transition to ABs, but these will concern the most insecure, unfair, low wage and unhealthy jobs that are in violation of international human rights standards. The people who lose these jobs will need to be redirected to improved livelihood and employment opportunities. The social justice and sustainability aspects will require greater attention in AB supply chain development support.⁶¹

Reinforcement of the new regulations and target achievement of the transitioning targets will need to be monitored for both the private and the public sectors. This will help to ensure that they are implemented by all actors involved, including government authorities at all levels and countrywide. In the current regulatory environment, various aspects of regulatory authority (of soil, environment, construction and others) are vested in different ministries. Without enhanced collaboration between the ministries it is practically impossible to bring about holistic changes in the behaviour of the industry actors. National level stakeholders suggested establishing a **Building Regulatory Authority (BRA)** that ensures good governance across the different ministries and departments involved in procurement of public construction and infrastructure works. Again, no provision has been made in the project design to support this.⁶²

All stakeholders interviewed mentioned the challenge of changing people's mind-sets and habits regarding the production and consumption of bricks in Bangladesh. The TB brickfields have been

part of the landscape and people's lives for more than 400 years. It is not something that will change rapidly. Most people still believe that TBs are best. Brickfields exist in almost every locality. The owners are often powerful leaders in the communities, involved in local politics and in charge of local markets much broader than bricks. The brickfields are often inherited over several generations. Changing this industry means dealing with local power dynamics and habits that are deeply entrenched in local culture and serve to maintain the status quo; in other words, it will take time for the TB industry to transition to modern ABs. Yet people do understand and are increasingly dissatisfied with the negative health impacts and climate-related threats and observe the first AB pioneers with interest and curiosity. The public interest litigations led by BELA demonstrate the awakening awareness and preparedness for change. There is no doubt that a window of opportunity exists not only at the national but also at the local level.

Media can play a crucial role in accelerating the change. Enforcement of the new legislation will require ample media attention. Sustainable building and the use of ABs should be widely promoted by national media, making it a general people's agenda. Although the project has undertaken several media initiatives (e.g. press releases and invitations to seminars, conventions, fairs; release of investigative reports to print media; feeds to the media fellowship programme about the PSBiB project; regular and dedicated PSBiB Facebook, Twitter and YouTube feeds –incl. talk shows, PSM and documentaries), it appears that a clear strategy to capitalise on the power of mass media to foster transformative change was missing. The PSBiB project's media engagements were mostly focused on creating 'project visibility', not on fostering change.⁶³

4.3.4 Changes in Adaptive and Absorptive Capacity (links # 4 in the ToC)

The contributions made by the PSBiB Project were mediocre and insufficient to generate the desired changes in adaptive and absorptive capacity. A challenge for government authorities in transitioning to ABs in public construction works and creating the initial market is the absence of a secured supply. While the project partners were able to prepare the technologies and raise awareness, time was too short to mobilise the political will and the resources for resolving the cost-benefit, supply chain linking and capacity issues that prevent producers (small and big) from adopting the new AB technologies.

Contribution Score 2 – relevant and insufficient

Evidence Score 3.5 – Relatively strong, reliable and nearly sufficient evidence

The HBRI has conducted the research for developing the AB technologies using dredged river soil. This included a physical test (to analyse the gravity, sieve, FM and Atterberg limit for plasticity and liquidity) and a chemical test (to measure the moisture, organic matter, Al₂O₃, Fe₂O₃, and lime substance) of the soil of the Kopotakkho and Turag rivers to determine its suitability for AB production. The research on environmental sustainability of AB technologies is new to Bangladesh. Former research conducted by the HBRI in the Nineties focused on the economic sustainability aspects of alternative building materials such as cement.

The research has helped to identify multiple AB technologies suitable for different parts of the construction. There are roughly two main categories: building blocks made of cement and building blocks made of dredged river soil (sand, silt and clay). In between these categories are a range of

mixed options. Production and use of AAC blocks using dredged river sand are economic, but these ABs can only be used for building the inner walls, not for constructing the frame of a building or the roof. Sand cement hollow blocks and thermal blocks using partly cement and partly river soil are stronger and more suitable for the frame and roof. Cement however remains a source of carbon emission and is also less economic. HBRI is currently developing a material map that serves as a guide on which technologies are suitable for which parts of the construction.⁶⁴

The HBRI has played an important role in the promoting new AB technologies to enterprises nationwide, but has not been able to assuage the major quality and cost-benefit concerns of the larger enterprises and government engineers that lead on the public construction and infrastructure works. Due to an internal shortage of senior research staff, the HBRI has not yet been successful in providing the solutions and evidence needed to convince government authorities and contractors of the benefits, and to also support and encourage local producers in the project target area to adopt the new technologies. According to the HBRI Director, however, the technologies are ready for uptake, but require finance for establishing **demonstration plants** in the districts close to the local producers and consumers. Furthermore, the **fiscal incentives** for industry leaders to shift to ABs are lacking, as the VAT for ABs is higher than for TBs. Therefore, the government will need to increase the VAT on TBs while decreasing it for ABs. As the MSP convener and former HBRI director pointed out: *“To shift the paradigm we need to reach both small producers and the big industries. Small entrepreneurs don’t have the ability to clear the market; only big enterprises can do so.”* In order to convince the big industry leaders, the government has to offer a significant market share and fiscal advantage for ABs, which will happen only after the 2019 Brick Control Act comes into force.⁶⁵

The main problem for switching to ABs in district government buildings is the availability of ABs in large enough quantities that meet the quality standards. Government engineers are not convinced that the ABs meet standards and that the producers can meet the government requirements. This is partly due to the negative precedent set by Concord in 2006, one of the bigger industry players that had started producing cement blocks of a disputable quality, which tended to brake during transportation. Demonstration plants will need to convince the engineers and encourage producers in the districts to adopt AB technologies.

“To shift the paradigm we need to reach both small producers and the big industries. Small entrepreneurs don’t have the ability to clear the market; only big enterprises can do so.”

(KII with MSP Convener and former HBRI)

On 14 January 2018, the Prime Minister’s Office (PMO) issued a letter to the line departments (PWD, LGED, DDM etc.) demanding the use of ABs in public construction works, and directing all ministries/ departments/agencies to inform the PMO about the measures taken by them to use ABs developed by HBRI within four weeks. This letter was the result of the project’s influence and lobbying through the DoE. A letter from the Prime Minister generally cannot be ignored. Yet the letter was never distributed by the national PWD to the district-level authorities. This was apparently because no technical guidance is provided in the National Building Code (NBC) for public construction and procurement regarding the purpose and relative strength of the different AB types. The NBC allows for the use of ABs if the technical requirements of the buildings are satisfied, but guidance was needed that specifies how each type of AB meets these requirements. The NBC was vetted and revised in 2017 to include the guidance, but the revised version had not yet been released. In principle, PWD’s Chief Engineers have the power to directly advise the Parliament regarding the acceptance of ABs and concurring NBC revisions. Reportedly, political

manoeuvrings have delayed the process. Stakeholders are quite optimistic that once the 2019 amendments to the Brick Control Act are enacted, this will finally change.⁶⁶

To pilot the new AB technologies and develop business models, the project targeted 15 MSMEs. According to the project's latest MEL study report, five of these have initiated the process of investing in the AB technologies late 2018. None of them have yet been able to adopt and pilot the technologies, mainly due to the delay in the HBRI's research outcomes, which were unavailable until 2018. The 2018 pilot was further constrained by a numbers of factors. MSME staff and management were occupied on their brickfields half of the year during the high season, limiting their ability to engage with the project. Also, the elections interrupted the activities and prevented the piloting in 2018. Significantly, the machinery and raw materials were (and still are at the time of the evaluation) not available in the domestic market.⁶⁷ Furthermore, the MSMEs could not obtain loans for investing in the new machinery and technical capacity, due to the lack of a secured consumer market.⁶⁸

The distance to the rivers that provides the raw material –namely from Sadar and Manirampur Upazilas to Kopotakkho river in Jessore District, and from Savar Upazila to Turag river in Dhaka District– was too far for piloting and demonstration. Producers are used to having topsoil readily available within the vicinity of their brickfields, needing little transportation. Also, consumers or house builders are discouraged as long as ABs are not available in the local market. House owners will not pay for transportation of ABs from elsewhere if they have ready access to bricks in their own village. Demonstration is needed in the communities where the producers are located. Hence the project upazilas should have been selected nearer to the rivers.

A number of stakeholders (incl. government officials/engineers, brick field owners, individual consumers) suggested that the current project area is too geographically limited to have any meaningful impact on the country's adaptive and absorptive capacity. To encourage brickfield owners to shift their production to ABs and to manage the risks, they will need a larger market of consumers, and at the same time, they also need to make sure they can supply the market in their own locality. The project should be able to reach a critical mass, requiring a wider geographic area with a larger number of producers, traders, construction workers, and consumers. Furthermore, to build and demonstrate the business and sustainability case of the AB technologies, their piloting and business modelling should be done in at least three different areas using the different types of river soil available in the country e.g. with river sand in the upstream or Northern area of the country, with river clay in the downstream or Southern area and with silt in the hill areas to the East.⁶⁹

Clearly, support is needed to connect the producers to the local house builders, to suppliers of raw materials and machines and to finance. Business modelling and support is also needed to ensure the transition to ABs will be feasible for small businesses and to help them access concessional finance. Impact investments are needed in demonstration projects for improved AB production and supply chain linking. A 500-600m proposal has been submitted by the DoE to the WB that focuses on pollution (of water, land, air) but has an important subcomponent on AB demonstration. This, however, may be insufficient to reach the 'critical mass' needed to achieve the desired transformative changes countrywide.⁷⁰

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The *Promoting Sustainable Building in Bangladesh* (PSBiB) project (January 2016 – June 2019) aimed to reduce the negative impacts of the boom in the construction and house building industry in Bangladesh on the environment, livelihoods and communities by enabling a transition from unsustainable Traditional Bricks (TB) to sustainable Alternative Building Blocks (AB). Drawing on the assumption that market incentives can lead to an effective and long-term transformation of the sector, the project worked to create the enabling policy environment through intensive advocacy and coalition building⁷¹, and initiate the market by raising user and consumer awareness about the benefits of ABs⁷², while also strengthening producers' capacity to transition to AB production and manage associated risks⁷³.

This evaluation examined the **effectiveness** and **relevance** of the PSBiB project, with a focus on **policy change** and contributions to strengthening the country's **resilience** during the three-year period under evaluation that ran from January 2016 (at the beginning of the project) until February 2019 (when the evaluation was conducted). For the purpose of this evaluation, the PSBiB project's Theory of Change was framed around three interrelated 'capacities' of Oxfam's Resilience Framework:⁷⁴

1. The *transformative* capacity of the institutions to achieve an effective and long-term transformation of the sector to more sustainable technologies and business practices;
2. The *adaptive* capacity of the brick industry to adopt sustainable technologies and business models that can prevent environmental, economic and social stresses and shocks; and
3. Its *absorptive* capacity to cope with stresses and shocks through inclusive supply chain linking and risk management strategies.

A 'realist' and 'transformative' approach called PIALA (Participatory Impact Assessment and Learning Approach) was used to design and implement a fit-for-purpose evaluation that assessed '*contribution to change*' in relation to '*context*'.

Bangladesh has relatively weak institutions and law enforcement, and is known for its widespread corruption and general lack of accountability in public and private sectors, all closely linked to the country's short history of violent elitist power struggles.⁷⁵ In this particular context, the evaluation found that the PSBiB project's strategies and interventions have been most significant and relevant in achieving the necessary changes in policies and legislation for promoting sustainable building materials and halting the extraction of topsoil from fertile land and protected areas. These changes were *conditional* to building the institutional and industry's capacity to transform the sector.

Amendments to the Brick Control Act were passed by Parliament in February 2019, and amendments to the Environment Conservation Act and a new Conservation of Agricultural Land Act are expected to be approved in 2019. These changes are achieved with clear and direct contribution from the project. The new legislation prohibits unsustainable brick production and consumption and promotes the use of alternative technologies that reduce pollution and prohibit

the use of agricultural topsoil. Major strides have been taken regarding the inclusion of ABs in the government procurement schedules. With the new legislation coming into force during 2019, ABs will become mandatory in public sector construction works and thus more visible in smaller towns and suburban areas. This will help to create the initial market needed for producers to attract finance for investment in AB technologies. The evaluation found that the project's efforts to raise awareness and develop knowledge among building experts, brick manufacturers and the wider public, have significantly contributed in building the momentum towards a sector-wide transition to ABs.

While significant and highly necessary, the project's contributions have been insufficient in triggering the market and setting the transition process in motion. The evidence suggests that this will not take place before the new legislation comes into force in the course of 2019. The government will also have to set clear transitioning targets for both the public and the private sector, as well as including the necessary guidance in the National Building Code and creating fiscal incentives to make ABs more attractive. The target setting will depend on the 'readiness' of the technologies and the manufacturers to start the supply (i.e. adaptive capacity). The project partners were able to prepare the AB technologies and started promoting them in the project area and around the country. However, they did not succeed within the three-year period under evaluation to resolve the quality and supply chain-linking issues (i.e. absorptive capacity) that prevent manufacturers from adopting the new AB technologies. The planned piloting of the AB technologies with 15 targeted MSMEs to develop the business models have not yet taken place due to the delay in the technology research, the 2018 national elections, and TB industry lobby's resistance to change.

Last, the project has made important but insufficient contributions to building the transformative capacity of Bangladesh's institutions –e.g. through creating the Multi-Stakeholder Platform (MSP) that raises awareness and enables systemic learning among the different stakeholders; engaging with policy research that helps to identify the gaps and weaknesses in the existing legislation; and through public interest litigations, campaigning and media events for making the general public aware of the necessity of protecting and strengthening the country's natural resource base. The project has not been able to institutionalise or consolidate these steps, or form the mechanisms that will sustain the activities and continue transforming the sector after its closure in June 2019.

5.2 Conclusion

The evaluation concludes that this project was highly relevant and made important contributions during its short three-year period under evaluation to create the conditions for a transformation of the construction and house building sector. However, these contributions have not yet been consolidated and have not produced the mechanisms to continue and accelerate the change process towards making the sector sustainable. This was partly due to contextual factors (incl. the 2018 national elections) as well as research capacity issues (of the HBRI), which hampered and delayed the project's performance.

Another contributing factor was the project design. The project set-up was fairly technocratic, focused on achieving rigid Log frame targets that appeared unrealistic in the given political context. From a Sustainable Development perspective, the project would have benefitted from a more adequate time frame and a more holistic, flexible design to achieve transformative outcomes. Using a complexity-sensitive and adaptive management approach and methodology, grounded in a

thorough context and power analysis, would have improved outcomes. Likewise, the project required a profound understanding of the challenges of turning a 400-year old industry with a very short (localised) value chain into a long supply chain that uses modern technologies and requires advanced business capacities.

Given the country's acute and augmenting climate vulnerability, arguably, the focus of international development support should be on strengthening the country's resilience, and in particular, the capacity of its institutions to protect and manage its land and natural resource base, rather than on reducing GHG emissions. Among the top ten countries most severely and immediately threatened by global warming in the world, Bangladesh's GHG emissions is 0.5 ton per capita, far below the global average. There is no doubt, however, that the country will lose considerable parts of its land due to rising sea levels in the next decades.⁷⁶ It is tremendously urgent, therefore, to build the transformative capacity of its institutions and the adaptive and absorptive capacity of its communities, sectors and industries to preserve, protect and strengthen the country's land and natural resource base.

5.3 Recommendations

Based on the findings and conclusions put forward in this report, the evaluation makes the following recommendations to Oxfam Bangladesh and its partners and donors, namely:

1. Capitalise on the new legislation coming into force and the momentum built towards triggering the market by ensuring that the new legislation attracts ongoing media attention in the coming 1-2 years with national coverage. Media can play a crucial role in accelerating change. Enforcement of the new legislation will require ample media attention. Sustainable building and the use of ABs should be widely promoted by national media, making it a general people's agenda.
2. Build a coalition of international agencies that have an interest in continuing and/or funding the work of transforming the construction and house building industry –such as UNDP and the World Bank– to mobilise resources and attract impact investments in building the absorptive and adaptive capacity of the sector. This should be integrated from a strong social and economic justice perspective. Impact investments for solving the capacity and supply chain issues and establishing demonstration sites will be needed in at least three different parts of the country. This will allow for the pilot-testing and business modelling of AB production using different river soil materials. To encourage brickfield owners to shift their production to ABs and to manage the risks, supply chain linking and AB extension support will be required at a suitable scale to reach a large number of producers, traders, construction workers, and consumers.
3. Obtain new funding to work with BELA and the DoE on consolidating and formalising the Multi-Stakeholder Platform (MSP), with a clear plan and strategy for the next three years to ensure that (among others):
 - the HBRI research on AB technologies and its AB material map is finalised;
 - the necessary guidance is developed and included in the National Building Code;
 - further amendments are made to the legislation to protect land and natural resources;
 - national policy dialogues are organised on a regular basis for addressing the problems that emerge in transitioning to ABs;
 - a cross-ministerial coordination and regulatory authority is created that ensures good governance of both public and private construction and infrastructure works using sustainable materials; and
 - MSP activities are also taken up by the districts.

The main purpose of the MSP would be to engage all relevant stakeholders in systemic learning and identifying suitable solutions that prevent further depletion of the country's land and resources, and to collaboratively monitor and adapt these solutions whenever new environmental and social sustainability threats or issues emerge.
4. For this evaluation to elicit critical debate and reflection, we recommend the Oxfam project team and partners organise a larger stakeholder sense-making event around the findings of this report. This will hopefully lead to stakeholders enacting these recommendations as they drive the transformative change process in Bangladesh after project closure.

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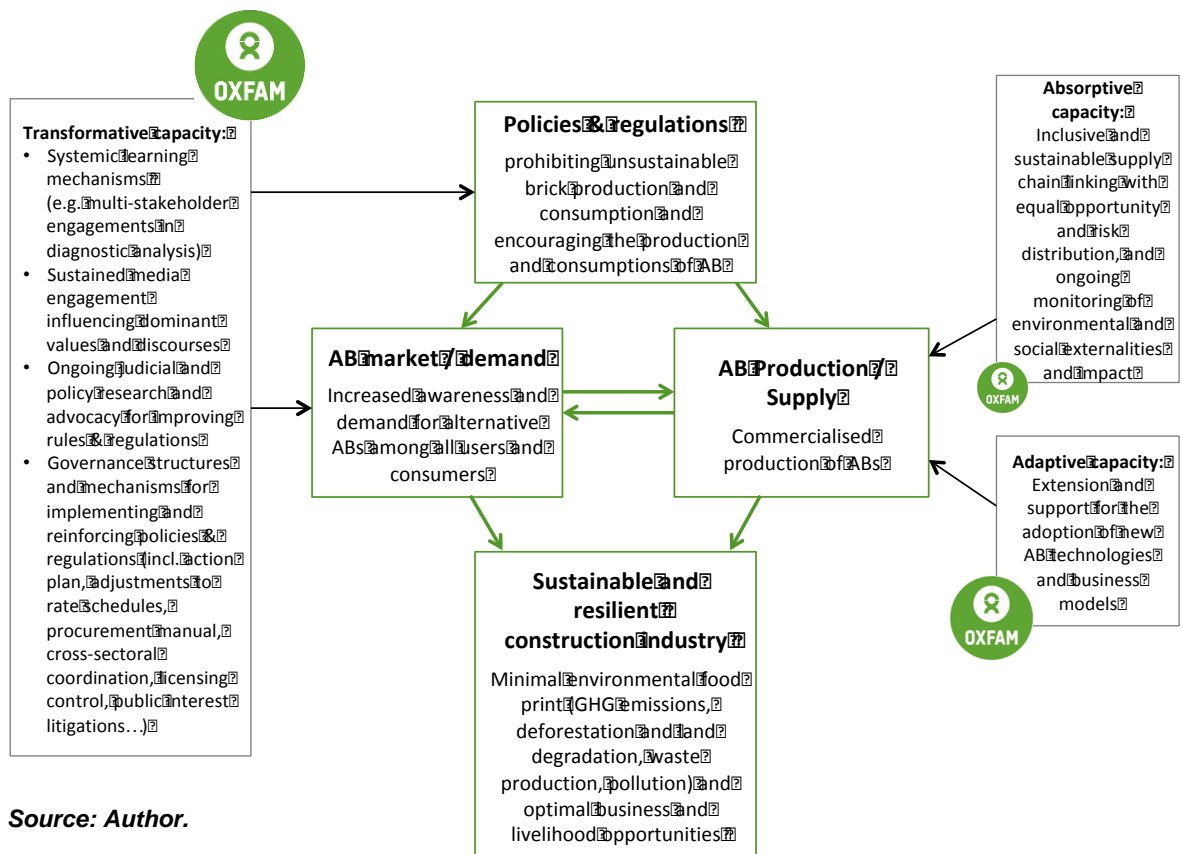
Source: Author

ANNEXES

I. Theory of Change Framed around Resilience

The diagram in Figure 2 below presents the original framing of the PSBiB project's Theory of Change around the three “Capacities” of Oxfam’s Resilience Framework (Jeans et al, 2016). The diagram was constructed based on a desk review of project documents and consultations with project staff. It follows the same logic as the Theory of Change diagram presented in **Figure 1** in **Section 2.3**.

Figure 2 – Theory of Change framed around ‘Resilience’



Whether the country and its construction industry have become sustainable and resilient can be assessed only in the longer term. By hypothesising the particular characteristics that determine how well the different actors at the local and national level are able to cope with shocks, positively adapt to change and transform the industry and the governance system, it is possible to assess the changes in these characteristics over time to get a sense of the country’s status of resilience (Oxfam GB, 2013).

Drawing on Oxfam's framework and the literature on supply chains and resilience⁷⁷, we hypothesise the following characteristics of **absorptive**, **adaptive** and **transformative capacities** needed for the construction industry to become sustainable and resilient:

- **Absorptive capacity** to cope with stresses and shocks e.g. through developing effective "risk management"⁷⁸ mechanisms, and assets/linkages ensuring livelihood viability, accessible to the different actors in the AB value chain.
- **Adaptive capacity** to prevent stresses and shocks e.g. through developing new technologies, new forms of partnerships and innovative business models for sustainable brick production and natural resource management/development practices; and creating access to productive resources and services supporting producer diversification and innovation for AB production and localised supply at scale.
- **Transformative capacity** to change the system and create new structures e.g. through developing a more systemic understanding of the problems among the stakeholders in the brick industry (e.g. regular multi-stakeholder dialogues and engagement in collective analysis); influencing dominant values (e.g. media campaigning using traditional and social media and YouTube); creating understanding among judicial and policy experts of the gaps and weaknesses in the existing policy and regulations framework (e.g. through policy research and advocacy for law amendments); and changing governance structures for reinforcing the rules and regulations (e.g. public interest litigations, cross-sectoral coordination, multi-stakeholder platforms, licensing control).

II. Guiding Questions for Data Collection

The following set of questions guided the semi-structured interviews with all the key stakeholders at the national level and in Jessore District.

1. *What has changed in terms of policies and regulations to prohibit unsustainable brick production and consumption, and enable AB technologies and businesses?*

What amendments have been made to existing legislation, and what additional legislation has been created to enforce a complete transition from FCK-based TBs to sustainable AB that do not use topsoil and non-renewable fossil resources, pollute the environment, or threaten public health? E.g.:

- amendments to the 2013 Brick Control Act prohibiting the use of top soil
- 2017 draft National Building Code including provisions for the use of ABs
- amendments to the 1997 Environmental Conservation Act
- 2018 draft Conservation of Agricultural Land Act
- inclusion of AB in the rate schedules of line departments (in particular, the Public Works Division (PWD) and Local Government Engineering Department (LGED)) for public construction works?

2. *How effective are these changes, and why are they effective/ineffective?*

To what extent have the changes in the policies and regulations been effectively enforced? Where are they in the process of their making? What steps are yet to be taken in order for the improved and new legislation to come into force? What mechanisms are in place to enforce the improved and new legislation, once enacted?

3. *What explains these changes? What and who contributed to the changes? What supported or undermined the outcomes?*

- Has anything changed in governance structure that has helped to create (or thwart) the desired changes and enforce their implementation?
- How strong is leadership at the different levels in standing behind the improved and new legislation and the goal of a complete transition to sustainable brick production and consumption? What has (positively or negatively) influenced leadership?
- How effective was the letter from the Prime Minister's Office to the line departments (PWD, LGED, DDM etc.) demanding the use of ABs in public construction works? Has it influenced the government administration's decisions at the national and district levels? Why / Why not?
- What external pressures and influences have supported or thwarted the outcomes? How have the national elections of December 2018 affected the outcomes? What has been the influence of international institutions such as UNDP and the WB?
- How effective has the project's media engagements been in influencing dominant values and discourses?
- What has been the influence of the policy research and policy dialogues conducted and organised by the project? How effective has it been for eliciting learning and awareness among the different stakeholders and authorities?

- What has been the influence of the Multi-Stakeholder Platform (MSP) at the national and at the district level in the project area on the changes in policies and attitudes?
- What has been the influence of the different trainings organised by the project? How effective have they been so far in creating a better understanding of the demand for more ABs among different users and consumers?
- What alliances has been built by the project that contributed to the changes in legislation?

4. *How relevant and sufficient are these changes likely to be for creating the desired market incentives that should lead to a more sustainable and resilient brick supply chain and construction market?*

- Is there enough evidence⁷⁹ provided about the cost-effectiveness of the AB made from dredged river soil for the users and consumers; the feasibility of producing and delivering AB made from dredged river soil at scale; and the commitment of the government to using these ABs and supporting the transition to AB production at a national scale?
- What indicates the government's commitment to ABs in public construction procurements? To what extent are ABs included in the Tender Rate Schedules of the different line departments⁸⁰? How does this affect the adoption of ABs in government-led construction projects?
- How and to what extent can the project be held responsible for triggering the government's commitment to adopting ABs in public construction works?
- Are sufficient incentives created for the brick producers to take the risk and make the transition to the AB technologies? Are sufficient incentives created for the brick users and consumers to shift from TBs to ABs?

III. Overview of Consulted Stakeholders

Project Partners

Organisation	Name & function
Oxfam	<ul style="list-style-type: none"> Anisur Rahman Chowdhury (Urban Manager) Dabaraj Dey (Senior Program Officer) Khalid Hossain (Economic Justice Resilience Manager) Mostafijur Rahman (Funding & Quality Director)
Bangladesh Environmental Lawyers Association (BELA)	<ul style="list-style-type: none"> Syeda Rizwana Hasan (Chief Executive Lawyer) Rokibul Islam (Campaign Officer) Rumana Afroze Dipti (Research Associate)
Jagorani Chakra Foundation (JCF)	<ul style="list-style-type: none"> Aditi Arzoo (Deputy Executive Director) Ashraful Ashraful Haque (Project Manager) PSBiB Project Team
Housing and Building Research Institute (HBRI)	<ul style="list-style-type: none"> Shamim Sir (Director) Akhter Hossain Sarker (Senior Research Officer)
Dhaka Multi-Stakeholder Platform (MSP)	Mohammad Abu Sadeque (Engineer, MSP Convener, former Director of HBRI)

Project Funders

Organisation	Name & function
EU Delegation	<ul style="list-style-type: none"> Mohammad Sifayert Ullah (Programme Manager Climate Change and Disaster Preparedness) Manfred Fernholz (First Secretary, Food and Nutrition Security and Sustainable Development)

National Stakeholders

Organisation	Name & function
Department of Environment (DoE)	Ziaul Haque (Director)
Public Works Department (PWD)	<ul style="list-style-type: none"> Jahidul Islam (Engineer) Azizul Haque (retired Chief Engineer)
Institution of Architecture Bangladesh	Mobesser Sir (Architect)
Bangladesh University of Engineering and Technology, Green Architecture Cell	Ashikur Rahman Joarder (Professor)
UNDP	Arif M. Faisal (Programme Specialist Environment Sustainability & Energy)

District & Upazila Government Stakeholders

Organisation	Name & function
Department of Environment (DoE) at Jessore District	Nazmul Huda (Deputy Director)
Local Government Engineering Department (LGED) at Sadar Upazila (Jessore District)	Shohidul Islam (Upazila Engineer)
National Housing Authority (NHA) at Jessore District	<ul style="list-style-type: none"> Emadul Islam (Assistant Engineer) Diki Kumar Sarkar (Sub Divisional Engineer and Deputy Project Director)
Local Government Engineering Department (LGED) at Manirampur Upazila (Jessore District)	Abu Sufian (Upazila Engineer)
Institution of Diploma Engineers Jessore District Branch	Nurul Islam (Sub-Divisional Engineer)

TB/AB Producers

Organisation	Name & function
Mir Group (AB)	Mohammad Salim (Deputy General Manager, Head of Marketing)
Manufacturing Owners Association (BBMOA)	Salim Reza (MS Fine bricks , VP BBMOA)
Asset bricks (TB + AB)	Shaheduzzaman Liton (Manager)
Cosba Parking Tiles (AB)	Dipok Das (Manager)
Mamun Bricks (TB)	Shaheduzzaman (Owner)
TB brickfield owners	<ul style="list-style-type: none"> Anonymous TB brickfield owner Anonymous TB brickfield owner

TB/AB Users and Consumers

Organisation	Name & function
Individual AB consumers	<ul style="list-style-type: none"> Robiul Islam (House Builder) Abdul Gaffar Bengali (House Builder) Abul kalam Azad (House Builder and AB Producer)
Individual TB users	<ul style="list-style-type: none"> Anonymous construction contractor Anonymous construction contractor Anonymous construction contractor

IV. Causal Process Observation Matrix (CPOM)

Table 2 – Causal Process Observation Matrix of the PSBiB Project Evaluation

ToC	Policies and Regulations	Market signal triggers AB investments	AB Market / Demand	AB Production / Supply	Resilience
Changes (positive, negative, or lack of)	<p>Achieved change:</p> <ul style="list-style-type: none"> The new amended 2019 Brick Manufacture and Brick Kiln Installation, or in short, the Brick Control Act (with nine amendments to the former 2013 Brick Control Act), proposed by the Environment, Forest and Climate Change Minister Md Shahab Uddin, was the first bill passed by the 11th parliament in 2019. (Kills with the DoE, Oxfam, BELA; article in the New Age Bangladesh 27/02/2019) A new Conservation of Agricultural Land Act is drafted that will be passed by parliament and approved and signed by the Cabinet this year. The Act helps to clearly define what is to be considered as agricultural land and therefore per the new Brick Control Act cannot be used for industrial production. It also protects agricultural land from other industrial uses. (Kills with the DoE, BELA) Amendments are proposed, and awaiting approval, to the Environmental Conservation Act which determine agricultural and natural resource conservation areas not suitable for industrial production (Kills with the DoE, BELA) Major progress has been made in moving towards promoting green procurement among government agencies by the inclusion of 18 more sustainable building block types in the 2018 Rates Schedule of the Public 	<ul style="list-style-type: none"> A strong momentum has been built in the past two years towards creating the initial market trigger for AB investments. With the passing of the 2019 Brick Control Act Amendments, the government now has the power to dictate and regulate the market to transition from TBs to ABs (Kills with the DoE, BELA, HBRI) There are some clear indications of an emerging change in attitudes and practices among the stakeholders in Jessore district: Jessore municipality started using ABs since PWD included ABs in its rate schedule; some house builders followed the example; and some new entrepreneurs started AB production. Among regular consumers there is increased awareness around the benefits of using ABs. LGED engineers in Jessore estimate that 10 percent of the local population is aware of the new AB technologies. (Kills with district-level DoE, house builders, AB producers, Oxfam, JCF; district-level LGED engineers in Jessore; SWITCH MEL Draft Report Dev Resonance p 20-21, 32-33) Strong market signal is yet to be created by the government through transitioning from TBs to ABs in public building. The government is the biggest consumer of bricks and building blocks (40-50 percent), but with a transitioning plan being drafted, it's just a matter of time now. The government will set the example of shifting to ABs in its public construction works, which will provide the evidence to convince the private user and consumer market of the quality and benefits of ABs (Kills with the DoE, BELA, Oxfam; national MSP convener and former HBRI director; Report of National Discussion 7 July 2018, p.2) Since July 2018, however, the Roads Transport and Highway Division (RT&HD) started using more bricks for road construction due to cost minimization. If this trend will be continued, it will create a negative market signal. Political will is needed to reverse the trend. (Report of National 	<ul style="list-style-type: none"> Architects are able to find clients favouring ABs over TBs. This indicates an emerging market for ABs and shift towards sustainable building among consumers. The challenge will be for the highly dense TB production areas to make the shift to ABs, for which loans and capacity building support will be needed. (Kills with the Institution of Architecture Bangladesh) Although there are some indications of an emerging demand for ABs, the demand remains a niche unable to trigger and accelerate the production. 	<ul style="list-style-type: none"> 17 brick producers engaged by the project had agreed to start producing ABs, acknowledging that TB production harms the environment and threatens food production, and that the government would ban the use of topsoil sooner or later ban. All waited for the market signal though. Present AB producers are mostly new entrepreneurs who understood that ABs is the future. They play an important role in demonstrating the business viability of ABs and supply small market segment that is using ABs. The project shifted its attention on supporting and engaging these new entrepreneurs (Oxfam, JCF, AB 	<ul style="list-style-type: none"> <i>"Bangladesh's fertile land degrades at a very high rate. Whatever we can do to prevent this, we should continue doing. An alternative for the construction industry is working with dredged river soil. The technology is ready for uptake. It requires change management to enable the sector to transition to this new technology."</i> (Kill with the HBRI) The change management referred to involves the development and deployment of the transformative, absorptive and preventive capacity contributing to building the country's resilience. There are concerns that the shift to ABs may lead to unemployment of brickfield labourers, with the machinery replacing labourers. However, this will concern only a very small part, as the production will be all year round and much higher, thus requiring more labour. Whereas most of the

Table 2 continued – Causal Process Observation Matrix of the PSBiB Project Evaluation

ToC	Policies and Regulations	Market signal triggers AB investments	AB Market / Demand	AB Production / Supply	Resilience
Changes (positive, negative, or lack of)	<p>Department. (KIs with PWD; SWITCH MEL Draft Report Dev Resonance p 38; SWITCH Asia_ Oxfam_Revised Interim Narrative _2017_ Final 10 May 2018)</p> <ul style="list-style-type: none"> An action plan with phased transitioning targets (15% by 2020, 25% by 2021 and 40% by 2022...) is already drafted by the DoE. An additional timeline and plan according to the DoE is also needed for the private sector (e.g. 20% by 2020). (KIs with the DoE, BELA) <p>More change needed:</p> <ul style="list-style-type: none"> To promote the use of ABs in public procurement, ABs still need to be included in the Rate Schedules of: the National Housing Authority (NHA) responsible for licensing of house building; the Capital Development Authority (RAJUK), responsible for public infrastructure and buildings in the capital district; and (most importantly) the Local Government and Engineering Department (LGED), responsible for local inter-district public construction works.⁸¹ This will enforce national and local authorities to approve the use of ABs in local public procurement, which will create visibility and thus help to market ABs in the smaller towns and peri-urban areas. (KIs with district-level DoE in Jessore) Incentives will also need to be put in place to accelerate the transitioning of TB s to ABs, for instance by increasing the VAT for TBs and decreasing the VAT for ABs. At this point then, local tax id higher for ABs than for TBs. As the MSP convener and former HBRI director pointed out. "To shift the paradigm we 	Discussion 7 July 2018, p.2)		<p>producers Jessore,</p> <ul style="list-style-type: none"> A challenge in terms of the availability of raw materials may emerge if a larger segment of the supply shifts to ABs. Part of the raw materials may have to be imported. (KIs with the DoE, BELA) 	<p>workers of the TB labour brickfields are seasonal (collecting topsoil only in the dry season which is 4-6 months per year), in AB factories they will be employed full-time and generally have better working conditions. They will enjoy greater job security with less health and financial risks, and less risk of physical accidents. Seasonal workers in the TB brickfields quite often have to take loans from the brickfield owners in the off-season to survive and feed their family. Often, they are unable to pay their debts with the income they earn during high season (which varies between 2.5 and 6 US dollars per day for men, and less than 2 US dollars per day for women for the same work⁸²). Consequently, they disappear and move to other areas in search for income. Child and bonded labour is common practice in the brickfields. This was confirmed by multiple primary and secondary sources. Health-wise, people average work no longer than 10 years in the TD brickfields before they fall ill. Even the managers</p>

Table 2 continued – Causal Process Observation Matrix of the PSBiB Project Evaluation

ToC	Policies and Regulations	Market signal triggers AB investments	AB Market / Demand	AB Production / Supply	Resilience
Changes (positive, negative, or lack of)	<p><i>need to reach both small producers and the big industries. Small entrepreneurs don't have the ability to clear the market; only big enterprises can do so.</i> (Kills with the national and district-level DoE, MSP convener and former HBRI director)</p> <ul style="list-style-type: none"> Clarification regarding what are "sustainable" ABs (as different from semi-sustainable "green blocks") is needed. There is confusion around what are sustainable and non-or semi-sustainable building blocks. Emission reducing "green block" technologies promoted by earlier projects of UNDP and the WB (such as HHK, ZZK, tunnel Kiln etc.) are considered "green" therefore "sustainable" yet reduce GHEs only by 50% while consuming high amounts of non-renewable energy and agricultural top-soil and requiring large private investment and advanced business capacity. Hence, they are not economically and environmentally sustainable. Under the new Brick Control Act, these technologies cannot be further promoted as sustainable building blocks. But also, for the ABs will monitoring be necessary, as well as business capacity strengthening. The investments are quite small and therefore significantly less of a financial risk (e.g. an individual house builder in Jessore purchased a small machine for producing the ABs for his own house and based on this experience decided to start a business). Yet there are challenges regarding production quality and supply chain linking, and environmentally there is a risk of erosion due to river and sand extraction from in 				<p>develop asthmatic problems over time. In AB factories people would be able to work much longer without getting ill.</p> <p>A small part (max 20 percent) of the low wage jobs may get lost in a transition to ABs, but these will concern the most insecure, unfair and unhealthy jobs which are not in accordance to human rights standards and therefore should be discontinued. People losing the jobs should be redirected to improved employment and/or farming opportunities. Enough job opportunities exist in the construction and other industries, so finding new and better jobs for these people should not be a problem. (Kills with PWD retired engineer, AB/TB owners in Jessore; LEGD in Jessore; SWITCH MEL Draft Report_DevResonance p 35)</p>

Table 2 continued – Causal Process Observation Matrix of the PSBiB Project Evaluation

ToC	Policies and Regulations	Market signal triggers AB investments	AB Market / Demand	AB Production / Supply	Resilience
Changes (positive, negative, or lack of)	concentrated areas. So there needs to be clear rules for river sand extraction for AB production (and other industries). (Kils with BELA, Oxfam, PWD retired engineer, district-level DoE in Jessore, individual house builders, UNDP, MSP convener and former HBRI director)				
Effects (positive, negative, or lack of)	The new 2019 Brick Control Act Amendments will not require site and technology clearances from the DoE anymore for the licensing of new brickfields. For the new AB manufacturers DoE clearance will be needed only for the raw material sourcing. But all existing TB brickfields will need to be inspected and those breaking the law will need to be brought to court, for which the DoE will need additional resources. When the Amendments are put into force (in the 3-4 months), most brickfields will become illegal. However, an immediate transitioning to ABs will not be feasible, as it would bring the supply of building materials for public and private construction to a halt. A phased transition plan needs to be put in place. But as long as the government continues approving the use of TBs in public construction works, nothing will change. They monopolise the market and share vested interests of PMs and government members directly or indirectly involved in the brick industry. A market signal therefore needs to be created by the government, by transitioning to Abs in public construction works in a timeframe	No major effects have been observed as the market signal is not strong enough yet.	No major effects have been observed as the market demand is not strong enough yet	No major effects have been observed as the producers have not started producing ABs yet.	<ul style="list-style-type: none"> Population in Bangladesh is increasing day by day whereas the agricultural land is decreasing over time. If the arbitrary use of topsoil is not controlled, food security will be threatened. (Report of National Discussion 7 July 2018, p.2) A number of stakeholders such as government officials/engineers, brick field owners, individual consumers, have suggested that the current project area is limited to two small geographic areas that is too small to have any meaningful impact nationwide. To encourage brick field owners to shift their production to ABs they will need a large market of consumers and at the same time for the individual consumers they need the ABs to be

Table 2 continued – Causal Process Observation Matrix of the PSBiB Project Evaluation

ToC	Policies and Regulations	Market signal triggers AB investments	AB Market / Demand	AB Production / Supply	Resilience
Effects (positive, negative, or lack of)	of maximum five years. This should help to accelerate the market for ABs and lower the risks and make it more attractive for producers to shift to ABs. (Kills with DoE, AB/TB owners) created by the government, by transitioning to ABs in public construction works in a timeframe of maximum five years. This should help to accelerate the market for ABs and lower the risks and make it more attractive for producers to shift to ABs. (Kills with DoE, AB/TB owners)				available locally; the current project areas are too small for necessary supply and demand. The project needs to reach out to wider geographic area with larger number of producers, traders, construction workers, and consumers. (SWITCH MEL Draft Report_DevResonance p 35-36)
Causes & Contributions	<ul style="list-style-type: none"> The project has been quite successful in its advocacy work. Positive and direct outcomes of BELA's work as part of the project were achieved with the Department of Environment on the amendment of the Brick Control Act (approved and passed by parliament), the amendment of the Environment Conservation Act (awaiting approval), and the drafting of a new Conservation of Agricultural Land Act (awaiting approval). The 2019 Amendments to the Brick Control Act of 2013 however did not change the definition of agricultural land, and therefore single-crop land could still be used for brick production. Single-crop land comprise substantial amounts of land which could be upgraded to multi-crop agricultural land. (Kills with the DoE, HBRI, BELA, Institution of Architecture Bangladesh; SWITCH MEL Draft Report, Dev Resonance, Jan 2018, p 27) The Multi-Stakeholder Platform (MSP) set up by the project was initially meant 	<p>Project influence:</p> <ul style="list-style-type: none"> Many organisations have contributed to building the momentum towards creating the initial market trigger for AB investments. The major contribution of the project has been the awareness raising, capacity building of masons and engineers, and the policy influence. (Kill with the HBRI, district DoE in Jessore) The district-level <u>multi-stakeholder Platform</u> set up by the project at in Jessore engaged masons, the government officials, brick field owners, engineers etc. in joint discussions every 2-3 months around the negative impacts of TBs and the positive benefits of ABs, and about the proposed changes in legislation. Some who attended started changing their practice –including: Jessore municipality, some private house builders, and some new AB producers. The changes in policy and legislation have created a window of opportunity for creating the market signal for ABs, but this will depend on the joint action of stakeholders for which the project built the alliances. Now the legislation is in place, enforcement and implementation is needed to create the market signal. Institutional setup, political willingness, and action plans are required to accelerate the market for alternative bricks. (Report of National Discussion 7 July 2018, p.2; confirmed by primary data listed below) 	The availability of ABs locally is identified as a challenge by many stakeholders for house builders to start using ABs. House owners will not pay for transporting ABs from elsewhere if they have readily access to bricks in their village. Support is needed for supply chain linking of raw material and machine suppliers, finance providers. Local house builders and producers. Business development support to MSME to transition to ABs is also necessary. Impact investments are needed from the WB	Discussions with brick kiln owners indicate that they are ready to take the risk of adopting new technology. They recognise the evolving policy environment which will continue to restrict the production and use of traditional fire bricks (even the less polluting technologies) and perceive that totally green production is the future for brick industry in Bangladesh. But all have indicated that the government should create an initial market first, by using ABs in its own construction projects. This would help to build confidence among the private investors. Moreover at	

Table 2 continued – Causal Process Observation Matrix of the PSBiB Project Evaluation

ToC	Policies and Regulations	Market signal triggers AB investments	AB Market / Demand	AB Production / Supply	Resilience
Causes & Contributions	<p>to serve as a pressure group for policy reform. The expectation was that the multi-stakeholder Platform would develop and implement an advocacy strategy based on their assessment of the situation. At the early pre-policy stage, it was meant to function more as an activist or working group rather than an established policy advisory group. (FirstMELstudyofPSBiB_FinalReport, p.7)</p> <ul style="list-style-type: none"> The project experienced difficulties in convening the different stakeholders (particularly relevant government agencies) in the MSP due to their limited availability and a general lack of interest. Government officials, architects and banks were preoccupied with things other than sustainable building materials. Because the MSP proved ineffective, the project pursued lobbying on an individual basis, which proved more successful in bringing about the desired changes in policies and legislation. (SWITCH MEL Draft Report Dev Resonance p 27) Alliances have been built with influential key individuals in the government (e.g. the director of the DoE) and leading actors in relevant professional institutes (e.g. the head of the Institute of Architects Bangladesh, ex secretary of the MoE). Awareness has also been raised around the need for and the potential benefits of ABs among professionals at the national and sub-national levels, in particular by HBRI and BELA at the national level and by JCF and HBRI at the sub-national level. (SWITCH MEL Draft Report Dev 	<ul style="list-style-type: none"> On 14 January 2018, the Prime Minister's Office (PMO) issued a letter to the line departments (PWD, LGED, DDM etc.) demanding the use of ABs in public construction works and directing all ministries/ departments/agencies to inform the PMO about the measures taken by them to use ABs developed by HBRI within four weeks. This letter was the result from the project's influence and lobbying through the DoE. A letter from the Prime Minister generally cannot be ignored. Yet the letter was never distributed by the national PWD to the district-level authorities, as no technical guidance is provided in the National Building Code. (Kills with BELA, Oxfam, national DoE, district-level DoE in Jessore; Report of National Discussion 7 July 2018, p.1) The project has targeted government officials at Upazila level to raise awareness and promote ABs but seems to have somewhat overlooked the all-encompassing role of the DC in its jurisdiction. The DC as head of the civil administration of any district can play an important role in efforts to reduce environmental degradation as well as promoting ABs. Lobbying with the DCs is likely to go some length in reducing irregular licensing and switching to ABs in public construction works. There are regular (monthly plus need-based) district committee meetings, multi-stakeholder coordination meetings (incl. government and civil society) and building and environment meetings. But ABs has not been on the agendas of all these meetings so far. It is believed that once the 2019 Brick Control Act Amendments are signed, ABs will be on all the district meeting agenda. (Kil with district-level DoE in Jessore; SWITCH MEL Draft Report Dev Resonance p 33) <p>Last, according to the project donors, Oxfam also missed the opportunity of opening the dialogue with the impact investors and multilateral players such as UNDO, WB, and ADB in around sustainability and resilience, to secure the financial and technical support for the AB supply chain linking and failed to raise the issue of social justice. The project lacked strategic oversight and quality assurance support to the project team and urban manager, and consequently Oxfam was unable to play its role of building a coalition at a higher, more strategic</p>	<p>and ADB in demonstration projects for improved AB production and supply chain linking. A 500-600m proposal of the DoE to the WB that are currently under negotiation, focus on pollution (of water, land, air) but has a subcomponent on AB demonstration (Kills with Oxfam, DoE, UNDP, SWITCH MEL Draft Report Dev Resonance p 34)</p> <p>Government is the biggest consumer of building blocks and bricks. In order for all relevant government departments and authorities to shift to ABs, the producers need to be able to supply the necessary quantity and quality. There had been a negative experience in 2006 with the first AB production by Concor, one of the very big industrial producers, in which 89 percent of the ABs were broken at the</p>	<p>least a year would be needed to train the workers on using the improved technology. (Report of National Discussion 7 July 2018, p.2; SWITCH MEL Draft Report DevResonance p 22)</p>	

Table 2 continued – Causal Process Observation Matrix of the PSBiB Project Evaluation

ToC	Policies and Regulations	Market signal triggers AB investments	AB Market / Demand	AB Production / Supply	Resilience
Causes & Contributions	<p>Resonance p 31-32)</p> <ul style="list-style-type: none"> Different interventions such as dialogue and meetings were carried out with policy-making and other key stakeholders like Institute of Architects Bangladesh (IAB); The Institute of Engineers, Bangladesh (IEB), Bangladesh Institute of Planners (BIP), Public Works Department (PWD) and Department of Architecture (DoAr) to discuss the policy gaps and scope of revision. Through these alliance-building events the project has created a high profile at different Government Ministries and Departments, and in particular left a strong footprint at the Ministries of Agriculture (MoA), Environment (MoEF) and Public Works (MoHPW). Participation in an inter-ministerial meeting was ensured to provide necessary amendments to the Brick Control Act. Organized by Ministry of Environment and Forest on 4 July 2017, BELA presented its recommendations for the amendment of the Brick Control Act. On 11 July 2017, BELA shared its recommendations officially. On 27 August 2017, the ministry organized an internal meeting on the final draft Amendment. <p>(SWITCH Asia_ Oxfam_ Revised Interim Narrative _2017_ Final 10 May 2018)</p> <p>Different interventions such as dialogue and meetings were carried out with policy-making and other key stakeholder like the Institute of Architects Bangladesh (IAB); The Institute of Engineers, Bangladesh (IEB), Bangladesh Institute</p>	<p>level, for transforming the brick industry into a socially, environmentally and economically sustainable business. (Kills with EU delegates)</p> <p>Public sector transitioning:</p> <ul style="list-style-type: none"> 14-18 different types of more sustainable building blocks have been included in the PWD 2018 rate schedule. But this is not enough for government to also use these building materials. Capacity will need to be built to produce the ABs according to the standards needed to guarantee quality and strength required quality for government procurement to choose ABs. Concor started with AVB production in 2006 but the quality was bad and 80% of the blocks broke, which gave ABs a bad reputation. There are also some water problems with the ABs that need to be solved. Moreover, knowledge is also needed about which ABs can be used for which parts of the construction, and masons will need to know how they must use the ABs, etc. Standards and guidelines regarding quality and use should be included in the National Building Code (NBC). PWD and other government departments follow this code. The code does allow the use of ABs if it satisfies the technical requirements of the buildings, but it does not specify the requirements for each type of AB. The revised version of the NBC was vetted in 2017 to address this, but the final declaration of the revised code still needs to be done. Political interests are playing out that try to prevent or at least slow down this process. In principle, the Chief Engineers of PWG are quite powerful and advise directly to the PM which building materials to accept or reject. Guidelines in the NBC are necessary, but more so the political will. If the political will is there, technical issues will be resolved easily (Kills with district-level DoE in Jessore, 2 PDW officials, on retired) Most Engineering officers of the government who attended the trainings conducted by JCF do not share their knowledge with others. Their superiors are not informed and don't show any interest, therefore won't take it further higher up. Without any engagement of the higher decision levels, nothing will change. (SWITCH MEL Draft Report Dev Resonance p 32-33) Yet everybody seems to believe that the political commitment 	<p>time of offloading from the trucks. It has now a new manufacturing plant producing hollow blocks that save 20 percent of the production and construction cost. (Kills the Institution of Architecture of Bangladesh, Public Works Department (PWD))</p>		

Table 2 continued – Causal Process Observation Matrix of the PSBiB Project Evaluation

ToC	Policies and Regulations	Market signal triggers AB investments	AB Market / Demand	AB Production / Supply	Resilience
Causes & Contributions	<p>of Planners (BIP), Public Works Department (PWD) and Department of Architecture (DoAr) to discuss the policy gaps and scope of revision. Through these alliance-building events the project has created a high profile at different Government Ministries and Departments, and in particular left a strong footprint at the Ministries of Agriculture (MoA), Environment (MoEF) and Public Works (MoHPW). Participation in an inter-ministerial meeting was ensured to provide necessary amendments to the Brick Control Act.</p> <p>Organized by Ministry of Environment and Forest on 4 July 2017, BELA presented its recommendations for the amendment of the Brick Control Act. On 11 July 2017, BELA shared its recommendations officially. On 27 August 2017, the ministry organized an internal meeting on the final draft Amendment.</p> <p>(SWITCH Asia_ Oxfam Revised Interim Narrative _2017_ Final 10 May 2018)</p> <p>Through these alliance-building efforts, meetings and policy dialogues, the MSP at the national level eventually started to bear fruit. The proceedings of the dialogues and meetings were sent to all the ministries and departments. Stakeholders acknowledge the value of this Platform moving forward to organise. The MSP is considered essential for organising the national policy dialogues that will be needed now even more than before to address the problems that will occur with the transitioning of the private and public construction market to ABs</p>	<p>is there; that the government is ready to make the shift to ABs, but that the lower government levels simply don't know how to do it. (Kils with the DoE, PWD, HBRI, district-level DoE in Jessore; SWITCH MEL Draft Report Dev Resonance p 32-33)</p> <ul style="list-style-type: none"> Transitioning from TBs to ABs in government construction works following the signing of the 2019 Brick Control Act Amendments require a five-year action plan, which is currently being drafted by the DoE and approved by Cabinet. There are still some quality issues, but these mainly concern the use of ABs for roof and frame, so the first targets could be achieved by enforcing the use of ABs for the inside walls, while shifting to ABs for the frame and roof later after research-based improvements to the technologies have been made. So, quality should certainly not hold the government from implementing the new 2019 Brick Control Act amendments. The transitioning process should not be too difficult as most countries already made the switch (Nepal, India, Pakistan). (Kils with the DoE, BELA, PWD, district-level DoE in Jessore) The biggest problem for making the shift to ABs in government buildings in the districts is the availability of ABs is large enough quantities and meeting the quality standards. Demonstration and start-up production plants are needed in the districts to encourage and teach producers to start AB production. (Kil with district-level DoE in Jessore) Road constructions require large amounts of stone chips, and the cheapest available ships are the brick chips. Road infrastructure development plans cannot be put on a halt until violable alternatives are available for the TB chips. But concrete stones could be easily imported from China and India, for instance. (Kils with PWD, MSP convener and former HBRI director) <p>Private sector transitioning:</p> <ul style="list-style-type: none"> The project has succeeded in motivating 17 brick field owners to undertake AB production with support from the project. All of the producers were in the process of signing MOUs in Nov-Dec 17. (SWITCH MEL Draft Report Dev Resonance p 20-21). 			

Table 2 continued – Causal Process Observation Matrix of the PSBiB Project Evaluation

ToC	Policies and Regulations	Market signal triggers AB investments	AB Market / Demand	AB Production / Supply	Resilience
Causes & Contributions	and create the necessary support and incentives. As the MSP convener and former HBRI director put it: <i>“After the project ends, who will raise the sustainability issues and raise the bar for ensuring the transformation of the sector into a truly sustainable industry?”</i> Government stakeholders plead for an expansion and formalisation of the Platform, involving all stakeholders (including also universities, professional institutions, the brick manufacturers association, banks, etc), hosted and facilitated for instance by the DoE. Formalisation would imply: formal membership, secured funding, formal bank account, and an institutional host and secretariat. (KIs with the DoE; Report of National Discussion 7 July 2018, p.3)	<ul style="list-style-type: none"> Producers around the country, including those interviewed for this evaluation in Jessore, are aware that the top soil is not a sustainable raw material for their industry, that policies are changing, and therefore, in time they will need to transition to ABs. Producers are made aware through the national MSP and the HBRI that reach all MSME across the entire country. But their profitability depends on the market. The market needs to be convinced, in particular in the districts, of the benefits of ABs (its strength, environmentally friendly, cost-efficiency of use...) through demonstration plots and the use of ABs in public construction sites. A few individual house builders discovered these benefits and built their houses using ABs. People in the neighbourhood learn about the benefits from these pioneers. (KIs with AB/TB owners, individual house builders in Jessore, MSP Convener & former HBRI Director) It's difficult to change the mentality, in particular at the local level. TBs are produced and used for over 400 years, so it will take time for people to adjust to the new ABs. People in Jessore are increasingly aware of the negative impacts of TBs and more and more in favour of ABs. The project's 2018 monitoring report confirms that among regular consumers there is increased awareness around the benefits of using ABs (17 out of 25 respondents were willing to use AB for the reason of environmental sustainability, cost-efficiency and quality), but that many are waiting to see the results achieved by early adopters. The project shifted focus therefore on pilot producers and early adopters. But the business community is resistant to change. Enforcement of the new legislation therefore will require ample media attention as well as public interest litigations. Media should pay more attention to new technologies. In remote places, demonstration buildings should be built near public places such as the market and the mosque. Sustainable building and the use of ABs should be widely promoted by national media, making it a general people's agenda. A more concerted effort is needed of government, media, and banks providing concessional loans to AB producers (KIs with the national and district-level DoE, BELA, HBRI, DPW, the Institution of Architecture 			

Table 2 continued – Causal Process Observation Matrix of the PSBiB Project Evaluation

ToC	Policies and Regulations	Market signal triggers AB investments	AB Market / Demand	AB Production / Supply	Resilience
Causes & Contributions		<p>Bangladesh, AB/TB owners in Jessore, district-level DoE in Jessore, MSP Convener & former HBRI Director; SWITCH MEL Draft Report Dev Resonance p 20-21; SWITCH Asia_ Oxfam_ Revised Interim Narrative _2017_ Final 10 May 2018)</p> <ul style="list-style-type: none"> The availability of ABs locally is identified as a challenge by many stakeholders for house builders to start using ABs. House owners will not pay for transporting ABs from elsewhere if they have readily access to bricks in their village. Support is needed for supply chain linking of producers to local house builders, to suppliers of raw materials and machines, and to finance. Business development support to MSME to transition to ABs is also necessary. Impact investments are needed from the WB and ADB in demonstration projects for improved AB production and supply chain linking. A 500-600m proposal of the DoE to the WB that are currently under negotiation, focus on pollution (of water, land, air) but has a subcomponent on AB demonstration (KIIs with Oxfam, DoE, UNDP, SWITCH MEL Draft Report Dev Resonance p 34)) A 500-600m proposal of the DoE to the WB that are currently under negotiation, focus on pollution (of water, land, air) but has a subcomponent on AB demonstration (KIIs with Oxfam, DoE, UNDP, SWITCH MEL Draft Report Dev Resonance p 34)) Producers who engaged in the district-level MSP discussions are aware of the environmental, economic and technical benefits of ABs, but will need loans and the government's market to transition to ABs. Without this market, they cannot obtain then loans to purchase the machines. (KIIs with AB/TB owners)) <p>Governance:</p> <ul style="list-style-type: none"> Capacity will be needed on the part of the DoE and DO to inspect all brickfields and dismantle those breaking the law. Reinforcement of the new regulations and targets will be needed not only for the private sector but also for the public sector, to ensure that they are well implemented by all government authorities at all levels. In the current regulatory environment various aspects of regulatory authority (of soil, environment, construction and others) are vested in different ministries. Without enhanced collaboration between the ministries it is practically impossible to bring about holistic changes in the behaviour of the market actors. A building 			

Table 2 continued – Causal Process Observation Matrix of the PSBiB Project Evaluation

ToC	Policies and Regulations	Market signal triggers AB investments	AB Market / Demand	AB Production / Supply	Resilience
Causes & Contributions		<p>Regulatory Authority (BRA) will need to be established that ensures good governance across the different ministries and departments involved in procurement of public construction and infrastructure works. (KII with PWD retired engineer, district-level DoE in Jessore; First MEL study of PSBiB_FinalReport, p.5-6; Report of National Discussion 7 July 2018, p.2).</p> <p>Provision of evidence of what works, how and where:</p> <ul style="list-style-type: none"> The HBRI has conducted the research for developing AB technologies using dredged river soil (incl. physical testing of the soil of the Kopotakkho and Turag rivers determining gravity, analysing sieve, calculating FM and testing the Atterberg limit for plasticity and liquidity; as well as chemical testing of the soil from the two rivers to measure the moisture, organic matter, Al₂O₃, Fe₂O₃, and Lime substances for assessing suitability for AB production). According to the HBRI the technologies are ready for uptake but require finance to establish the AB demonstration plants around the country. (KII with the HBRI; Research paper “Sustainable Building Materials in Bangladesh”; Report of National Discussion 7 July 2018, p.2) Due to an internal shortage of senior research staff leading on the research, the HBRI's contributions to the project outcomes remained unsatisfactory as it did not provide the solutions and evidence needed to convince the government authorities to change procurement practices and put in place incentives of producers to start AB production using dredged river soil. (KII with Oxfam, EU delegates, and the MSP convener and former HBRI director) The project attempted to pilot the new technologies in the wrong areas. In Jessore for instance there is no sand locally available. Local AB production should be piloted in the locations where the different types of raw materials are dredged from the rivers – e.g. upstream (north) with sand, downstream (south) with clay, and in the hills (east) with silt. (KII with MSP convener and former HBRI director). The research by HBRI is relatively new. Some research was undertaken on cement between 1992 and 1998 but the focus was more on the economic aspects at that time. The technologies developed in the past years were focused on gaining environmental benefits. The different technologies are 			

Table 2 continued – Causal Process Observation Matrix of the PSBiB Project Evaluation

ToC	Policies and Regulations	Market signal triggers AB investments	AB Market / Demand	AB Production / Supply	Resilience
Causes & Contributions		<p>suitable for particular aspects of constructions, for which a material map is being developed. The two main options for AB are cement or dredged river soil (sand and silt). Production and use of AAC blocks using dredged river sand are very economic, but the ABs can only be used for building the inner walls, not for constructing the frame of a building. Dredging the rivers is necessary for improving the navigational depth and maintain the channel, but there is the challenge of bringing the dredged river soil to the local producers. Sand cement hollow blocks and thermal blocks have been developed and promoted as the two other AB technologies saving agricultural topsoil. Albeit in small portions, both still use cement to achieve the desired quality and strength. Cement remains a source of carbon emission and is also not available at a reasonable cost. (KII with the HBRI director, MSP convener and former HBRI director, DoE; Research paper “Sustainable Building Materials in Bangladesh”; Report of National Discussion 7 July 2018, p.2)</p>			
Context and Conditions	<ul style="list-style-type: none"> On 30 December 2018 general elections were held in Bangladesh, resulting in a landslide victory for the Awami League led by Sheikh Hasina. The elections were marred by violence and claims of vote rigging –the latest chapter in a history of political violence since independence 48 years ago. The country freed itself in a bloody liberation war with Pakistan that still resonates and defines its political landscape. Violence is a persistent feature of its politics and the country has alternated between fragile forms of democracy and several bouts of military rule. Its first prime minister, Hasina's father Mujibur Rahman, was murdered in an army coup in 1975 along with most of the family while Hasina was out of the country. For more than two decades, Hasina has traded power with Khaleda Zia, the head of the BNP (Bangladesh National party) and the League's main rival. Zia's war hero husband Ziaur Rahman was assassinated while serving as prime minister in 1981. But Hasina has cemented her dominance in the past decade, using the state tools at her disposal to weaken the BNP and its organs, clamp down on judicial and media dissent and mostly check the country's small but potent Islamist movement. Her dominance has contributed to a period of relative political stability that has helped the country's economy grow at more than 6% each year thanks largely to the garment industry that makes up more than four fifths of Bangladesh's exports. Foreign direct investment has remained low, however, due to poor infrastructure, corruption, policy uncertainty as well as lingering concerns about the country's politics. Poverty rates have fallen, and the country's GDP has grown by 150% in the past decade. But some analysts say the wealth is not spreading fast enough and has not translated into more resilient or transparent public institutions, deepening popular disquiet. (The Guardian, 31 Dec 2018; BBC 30 Dec 2018; Washington Post 31 Dec, 2018; Foreign Policy Jan 7, 2019; Wikipedia) In 2010, UNDP and WB projects started to promote emission-reducing “green block” technologies such as Hybrid Hoffman Kiln (HHK) and Zig-Zag Kilns (ZZK). BELA was also involved in the UNDP project, and had been advocating for ABs since 2001. These “green block” kilns and technologies are more efficient in terms of their coal usage, but cut GHG emissions only by half, while still consuming high amounts of non-renewable energy and agricultural top-soil and requiring very large private investment or loans and advanced business capacity. Hence, they are not economically and environmentally sustainable. Reportedly, US \$ 44m of a total investment fund of 50m for concessional loans offered by the ADB and Bangladesh Bank to producers wanting to start producing green blocks, were left unutilized at the end of the UNDP project, due to the high investment risks and low business planning and management capacity. Moreover, not GHG but land degradation due to the extraction of topsoil is the main issue threatening the country's resilience. Bangladesh produces with its 2 percent of the world population only 0.5-ton per capita GHG, which is far below the global average, while its arable land is disappearing with 13 decimals per capita. Countries like China and India that have a much smaller population yet are double and triple the size of Bangladesh have prohibited the use of topsoil (China already since 1968). Importantly, an official ban on the use of agricultural topsoil was expected to come from the 				

Context and Conditions	<p>government sooner or later; large investments or loans from the Bangladesh bank and ADB in these “green block” technologies that use topsoil would undermine or prevent such a ban. A proposal for extension of the UNDP project therefore was unsuccessful in obtaining renewed funding. (KII with MSP Convener & former HBRI Director, BELA, UNDP, HBRI; UNDP online sources; First MEL study of PSBiB_FinalReport, p. 5)</p> <p>Landowners sell the soil of their land to the brickfields when they are in need of cash. Either they then turn it into ponds, or they have to wait for 6-7 years for then land to become fertile again. The scale at which this happens is threatens the country’s food sufficiency. (KIIs with district-level DoE in Jessore)</p>
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NOTES

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- ¹ This is **result area 3** in the project's logical framework.
- ² This is **result area 1** in the logical framework.
- ³ This concerns **result area 2** in the logical framework.
- ⁴ Cf. <https://collabimpact.org/piala>.
- ⁵ Transparency International's 2014 Corruption Perception Index ranks Bangladesh 145th out of the 174 countries and territories assessed, while World Bank's Worldwide Governance Indicators place Bangladesh in the lowest quarter of the percentile ranks (McDevitt, 2015; Rahman & Bari, 2016).
- ⁶ See different publications and blog posts: A Multidimensional Approach to Measuring Resilience (2013); Measuring Resilience: Lessons learned from measuring resilience in Oxfam's large-N Effectiveness Reviews (2015); Building Resilience: A meta-analysis of Oxfam's resilience Effectiveness Reviews (2017); Rising to the challenge: measuring an expanding concept of resilience in Oxfam's impact evaluations (2016); Sampling strategies for gendered impact evaluations (2018).
- ⁷ ILO (2014: 9).
- ⁸ Imran et al (2014).
- ⁹ Ibid.
- ¹⁰ Oxfam (2018: 8); Government of Bangladesh. (2017).
- ¹¹ Imran et al (2014).
- ¹² Bangladesh is a riverine country that lies in the biggest river delta of the world: the Ganges Delta system. Most of the country's land is formed through silt brought by the rivers. About 700 rivers flow through the country, constituting a waterway of total length of about 24,000 km, of which 6,000 km are navigable during monsoon and 3,900 km during dry periods, carrying 50 percent of all Bangladesh's cargo traffic (mainly bulk and petroleum products). Dredging soil from these rivers help to make them navigable. Cf. https://en.wikipedia.org/wiki/List_of_rivers_of_Bangladesh.
- ¹³ Bangladesh has a total of 64 *zilas* or districts and 493 *upazilas* or sub-districts.
- ¹⁴ Cf. <http://jcf.org.bd/at-a-glance>.
- ¹⁵ See Sections 3.1 and 3.2.
- ¹⁶ This will become clearer towards the end of this report in the concluding Sections 5.1 and 5.2. Context is described in Section 4.1.
- ¹⁷ See: Dev Resonance (2017; 2018a; 2018b); Oxfam GB (2016).
- ¹⁸ I.e. 'adaptive capacity' (see Annex I).
- ¹⁹ I.e. 'absorptive capacity' (see Annex I). Supply chain linking refers to the linking of all the actors and service providers involved in the production of the ABs, from the raw materials to the markets. Sustainable and inclusive supply chain linking implies ensuring equal distribution of opportunities and risks among the supply chain actors (incl. the workers, in particular women) and ongoing monitoring of environmental and social impact.
- ²⁰ The original framing of the Theory of Change around the three "Capacities" of Oxfam's Resilience Framework (Jeans et al, 2016) is presented in Annex I.
- ²¹ This was done in the course of August and September 2018.
- ²² During the evaluation it also became clear that, overall, the project's period of two and a half years of planned work in the three targeted subdistricts (Sadar and Manirampur in Jessore, and Savar in Dhaka) was far too short in the given context to expect any significant or observable impact at the local level (on the resilience of the MSMEs, the workers, the households in the surrounding communities, and the environment). This is explained in Section 4.3.3 (page 37): *"The TB brickfields are part of the landscape and people's lives for more than 400 years. It is not something that will change rapidly. Most people still believe that TBs are the best. Brickfields exist in almost every locality. The owners are often powerful leaders in the communities, involved in local politics and in charge of the local markets much broader than bricks. The brickfields are often inherited over several generations. Changing this industry means dealing with local power dynamics and habits that are deeply entrenched in local culture and serve to maintain the status quo. In other words: it will take time for the TB industry to transition to modern ABs."*
- ²³ cf. Section 1..
- ²⁴ See Section 2.3 and Annex I.
- ²⁵ See different publications and blog posts: A Multidimensional Approach to Measuring Resilience (2013); Measuring Resilience: Lessons learned from measuring resilience in Oxfam's large-N Effectiveness Reviews (2015); Building Resilience: A meta-analysis of Oxfam's resilience Effectiveness Reviews (2017);

Rising to the challenge: measuring an expanding concept of resilience in Oxfam's impact evaluations (2016); Sampling strategies for gendered impact evaluations (2018).

- ²⁶ See different publications and blog posts: A Multidimensional Approach to Measuring Resilience (2013); Measuring Resilience: Lessons learned from measuring resilience in Oxfam's large-N Effectiveness Reviews (2015); Building Resilience: A meta-analysis of Oxfam's resilience Effectiveness Reviews (2017); Rising to the challenge: measuring an expanding concept of resilience in Oxfam's impact evaluations (2016); Sampling strategies for gendered impact evaluations (2018).
- ²⁷ More information about PIALA can be found on: <https://collabimpact.org/piala>.
- ²⁸ If the project's piloting of AB production and local market creation would have taken place as planned (without delays), then the evaluation could also have looked at downstream resilience at the local level, using PIALA's configurational method (possibly in combination with software such as EvalC3) to compare the causal processes across the 15 MSMEs treated by the project and their surrounding communities and environments in the three targeted Upazilas or sub-districts. The cross-case comparison would have helped us to identify the causal attributes and combinations that lead to the best outcomes in terms of resilience. The configurational analysis method can also be used at an aggregated level to identify and compare causal attributes and combinations across many projects that are relatively comparable with regards to their design and context.
- ²⁹ Process tracing involves the descriptive reconstruction of the unfolding of events over time for each selected case, based on the collation of snapshot data around a series of key moments in the change process, permitting causal inference. This descriptive reconstruction process is essential in evaluations that cannot draw on large data sets or large amounts of comparable cases (such as for instance $n = 900$) to arrive at causal inference. Causal analysis in small- n evaluations draws on the strength and granularity of the explanatory evidence, requiring a great deal of in-depth research and substantial crosschecking of different sources, methods and perspectives. (Beach & Pedersen, 2013; Befani & Mayne, 2014; Collier, 2011; George & Bennett, 2005; Punton & Welle, 2015)
- ³⁰ An overview of the stakeholders interviewed is provided in Annex III. The Semi-Structured Interview questions are attached in Annex II.
- ³¹ The Guardian (31 Dec 2018); BBC (30 Dec 2018); Washington Post (31 Dec 2018); Foreign Policy (7 Jan 2019); The Common Wealth; Wikipedia.
- ³² Hasina's father, Mujibur Rahman and the country's first prime minister, was murdered in an army coup in 1975. His successor, General Zia Rahman (Bangladesh Nationalist Party), was murdered in an attempted coup in 1981, which was followed by another coup in 1983. General Hossain Ershad (Jatiya Party) remained in power for a bit longer but had to resign in 1990 after the floods in 1988 had made tens of millions homeless and caused ongoing demonstrations. Khaleda Zia (BNP and General Zia's widow) became the country's first female prime minister in February 1991, but had to make room for Hasina in 1996 after five years ongoing strikes and violent protests staged by Awami League in opposition.
- ³³ Transparency International's 2014 Corruption Perception Index ranks Bangladesh 145th out of the 174 countries and territories assessed, while World Bank's Worldwide Governance Indicators place Bangladesh in the lowest quarter percentile of the ranks (McDevitt, 2015; Rahman & Bari, 2016).
- ³⁴ McDevitt (2015: 2).
- ³⁵ Rahman & Bari (2016); Economy Watch (2010).
- ³⁶ World Bank (2016).
- ³⁷ ILO (2014: 9).
- ³⁸ Confirmed by multiple stakeholders interviewed in this evaluation. Influence of powerful industries is also reported elsewhere –cf. McDevitt (2015) and World Bank (2016), among others.
- ³⁹ E.g. amendments to the Brick Control Act passed by Parliament in February 2019, and amendments to the Environment Conservation Act and a new Conservation of Agricultural Land Act awaiting approval in the course of 2019. This is further detailed in Section 4.3.1.
- ⁴⁰ World bank (2015).
- ⁴¹ The 2019 assessment from the International Centre for Integrated Mountain Development (ICIMOD) predicts that in the *best-case scenario* the Himalaya will lose more than one-third of its ice by the end of the century, with very little or no time left to fix the problem. Himalayan peaks are warming between 0.3 to 0.7°C faster than the global average, and the loss of Himalayan ice would have devastating consequences for 1.6 billion people living in the mountains and downstream countries. Without the melting water from the Himalaya's glaciers, most of Bangladesh's rivers will dry out (Wester & Mishra, 2019).
- ⁴² The strings of evidence supporting our findings for each change area in the ToC, are presented in Section 4.3. The confidence scores for these evidence strings are added in footnotes. The evidence scores in the table below are the averages of all the confidence scores under each finding.
- ⁴³ Evidence score 4. Data from KILs with representatives of the DoE, HBRI, BELA, and the Institution of Architecture Bangladesh. Confirmed by secondary data from (among others): New Age (2019) and Dev Resonance (2018b: 27).
- ⁴⁴ Evidence score 4. Data from KILs with representatives of the DoE, BELA, JCF, HBRI, and the MSP Convener & former HBRI Director. Confirmed by secondary data from (among others): Dev Resonance (2018b: 31-32).

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- ⁴⁵ Reportedly, US \$ 44m of a total investment fund of 50m for concessional loans offered by the ADB and Bangladesh Bank to GB producers were left unutilized at the end of the UNDP project, due to the high investment risks and low business planning and management capacity (KIs with UNDP and HBRI). Note that countries like China and India that have a much smaller population but are double and triple the size of Bangladesh already for some time have prohibited the use of topsoil (China already since 1968). An official government ban on the use of topsoil sooner or later will also be expected to come into force in Bangladesh. As large investments in GB technologies would undermine or prevent such a ban, a proposal for extension of the UNDP project have remained unsuccessful in obtaining renewed funding.
- ⁴⁶ See also Section 4.1.
- ⁴⁷ Evidence score 4. Data from KIs with the MSP Convener & former HBRI Director and representatives of BELA, UNDP, and HBRI. Confirmed by secondary data from (among others): Dev Resonance (2017: 5), Oxfam GB (2018b: 31-32), and UNDP online sources.
- ⁴⁸ Evidence score 3. Data from KIs with representatives of the DoE, Oxfam, and BELA. Confirmed by secondary data from (among others): New Age (2019).
- ⁴⁹ Evidence score 2. Data from KIs with AB/TB owners, individual house builders in Jessore, the MSP Convener & former HBRI Director, and the present HBRI Director.
- ⁵⁰ Evidence score 3. Data from KIs with representatives of Oxfam, JCF, the district-level DoE, district and upazila LGED engineers, AB & TB producers, and individual house builders in Jessore. Confirmed by secondary data from (among others): Dev Resonance (2018a) and Dev Resonance (2018b: 20-21; 32-33).
- ⁵¹ Evidence score 4. Data from KIs with representatives from the HBRI, district-level DoE and district and upazila LGED engineers, and AB & TB producers in Jessore. Confirmed by secondary data from (among others): Oxfam GB (2018c: 2).
- ⁵² Evidence score 4. Data from KIs with representatives of Oxfam, BELA, JCF and the DoE, the national MSP convener and former HBRI director, and TB producers in Jessore. Confirmed by secondary data from (among others): Oxfam GB (2018c: 2).
- ⁵³ The PWD, NHA and RAJUK all are under the Ministry of Housing & Public Works, while the LGED falls under the Ministry of Local Government.
- ⁵⁴ Evidence score 4. Data from KIs with representatives of the PWD, the district-level DoE in Jessore, and the MSP convener and former HBRI director. Confirmed by secondary data from (among others): Dev Resonance (2018b: 38) and Oxfam GB (2018a).
- ⁵⁵ Evidence score 2. Data from KIs with representatives of the DoE, BELA and PWD.
- ⁵⁶ Evidence score 3. Data from KIs with representatives of the PWD and the MSP convener and former HBRI director. Confirmed by secondary data from Oxfam GB (2018c: 2).
- ⁵⁷ Evidence score 4. Data from KIs with representatives of the DoE, PWD, BELA, Oxfam, and the MSP Convener & former HBRI. Confirmed by secondary data from (among others): Oxfam GB (2018c: 3).
- ⁵⁸ Evidence score 4. Data from KIs with representatives of the district-level DoE and district and upazila LGED engineers in Jessore. Confirmed by secondary data from (among others): Dev Resonance. (2018b: 33).
- ⁵⁹ Evidence score 4. Data from KIs with representatives from the DoE (both national and Jessore District), BELA, the Institution of Architecture Bangladesh, and the MSP convener and former HBRI director.
- ⁶⁰ Anecdotal data obtained from the KIs conducted with TB and AB producers in Jessore indicate that the income of the labourers vary between 2.5 and 6 US dollars (200 and 500 BDT) per day for men, and less than 2 US dollars (150 BDT) per day for women for the same work.
- ⁶¹ Evidence score 3. Data from KIs with representatives from the PWD, LEGD and AB/TB owners in Jessore. Secondary data from: ILO (2014), Mostafa & Gustafsson (2014), and Dev Resonance (2018b: 35).
- ⁶² Evidence score 3. Data from KIs with representatives from the DoE, PWD, Oxfam and BELA. Secondary data from Dev Resonance (2017: 5-6) and Oxfam GB (2018c: 2).
- ⁶³ Evidence score 4. Data from KIs with representatives from the national and district-level DoE, the PWD, Oxfam, BELA, HBRI, and Institution of Architecture Bangladesh, the MSP Convener & former HBRI Director, and AB and TB owners in Jessore. Secondary data from (among others): Oxfam GB (2018a: 36) and Dev Resonance (2018b: 20-21).
- ⁶⁴ Evidence score 3. Data from KII with representatives from the HBRI and DoE. Secondary data from (among others): HBRI (2018) and Sarker et al (2019).
- ⁶⁵ Evidence score 4. Data from KIs with representatives from the Oxfam and the HBRI, and the MSP convener and former HBRI director. Secondary data from (among others): Sarker et al (2019: 2).
- ⁶⁶ Evidence score 4. Data from KIs with representatives from the national and district-level PWD, DoE and LGED, the Institution of Architecture Bangladesh, HBRI, BELA and Oxfam. Secondary data from (among others): Dev Resonance (2018b: 32-33) and Oxfam GB (2018c: 1).
- ⁶⁷ One of the new small entrepreneurs interviewed in this evaluation had ordered his first AB machine from Australia
- ⁶⁸ Evidence score 4. Data from KIs with representatives from Oxfam, BELA, JCF and the DoE, the national MSP convener and former HBRI director, and TB producers in Jessore. Secondary data from: Dev Resonance. (2018a: 38).

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- ⁶⁹ Evidence score 3. Data from KIIs with representatives from Oxfam, HBRI, JCF, the MSP convener and former HBRI director, and individual house builders in Jessore. Secondary data from: Oxfam GB (2018a: 20-21), Dev Resonance (2018a: 39) and Dev Resonance (2018b: 35-36).
- ⁷⁰ Evidence score 3. Data from KIIs with representatives from Oxfam, DoE, the EU Delegate in Bangladesh, and UNDP. Secondary data from: Dev Resonance (2018b: 34).
- ⁷¹ This is **result area 3** in the project's logical framework.
- ⁷² This is **result area 1** in the logical framework.
- ⁷³ This concerns **result area 2** in the logical framework.
- ⁷⁴ See Section 2.3 and Annex I.
- ⁷⁵ Transparency International's 2014 Corruption Perception Index ranks Bangladesh 145th out of the 174 countries and territories assessed, while World Bank's Worldwide Governance Indicators place Bangladesh in the lowest quarter of the percentile ranks (McDevitt, 2015; Rahman & Bari, 2016).
- ⁷⁶ See also Section 4.1.
- ⁷⁷ Cf. <https://policy-practice.oxfam.org.uk/publications/the-future-is-a-choice-the-oxfam-framework-and-guidance-for-resilient-developme-604990>.
- ⁷⁸ E.g. insurance, credit, and social protection.
- ⁷⁹ The literature suggests that the quality and outcomes of the research into the new technologies will be essential for policy uptake (Cf. ODI's Research and Policy in Development (RAPID) framework: <https://www.afidep.org/wp-content/uploads/2016/08/Module-1-Handout-4-ODI-RAPID-Model-of-Policymaking.pdf> and <https://www.odi.org/our-work/programmes/research-and-policy-development>). This does not merely concern the technical, but also the economic and socio-political aspects. Critical for uptake is whether a feasible and attractive solution is provided to the problem, and whether a critical amount of early adopters convincingly demonstrate this. In the case of ABs in Bangladesh, the project monitoring reports show the importance of the government setting a clear example and taking a lead on using ABs in public constructions. Another key success factor concerns the communication or the way the new AB technologies will be marketed, whether they are sufficiently couched in familiar terms while also responding to newly emerging trends. Interactive approaches, such as public debates and demonstration sites where people can get a first hand feel of the potential of new product, are generally found most effective.
- ⁸⁰ Public Works Division (PWD), Local Government Engineering Department (LGED), Department of Disaster Management (DDM), etc.
- ⁸¹ The PWD, NHA and RAJUK all are under the Ministry of Housing & Public Works, while the LGED falls under the Ministry of Local Government.
- ⁸² The figures provided by the x TB brickfield owners interviewed for this evaluation, varied between 200 and 500 BDT for men, and between 100 and 150 BDT for women for the same work.

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