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Bangladesh, Good Governance Privatized MFIs to
Incentivize Intrusion Preventative Species

Polly Akhtar stares into the distance as she explains to a reporter, “I was only a child when my parents wanted to marry me off with Abbas Ali. I did not want to marry then. I am a girl, we have no say in these matters. Everyone was okay with this marriage” (BRAC). Her country, Bangladesh, contains the 4th highest rate of child marriage in the world, wherein one in three Bangladeshi girls, aged 15 to 19, are married (BRAC); unfortunately, statistics such as this bear little impact in the minds of the American upper-middle class when donating, as Nobel Prize laureates Abhijit Banerjee and Ester Duflo elaborate in *Poor Economics*, “Our first instinct is to be generous...our second thought is often that there is really no point” (Banerjee, Duflo, 17) This microcosm of human behavior, in the absent inclination toward aid and international cooperation in the global political arena, while observable in every individual, may not be concerning, until a similar psychological ploy restricts international cooperation, for humans bear a single mentality, whether they are simply another person or the President himself. In a world where the Tragedy of the Commons is seemingly omnipresent, and negative externalities are routinely produced by the reckless lack of policies in developed, so-called first world nations, the optimistic arguments of aid pessimists, that “When markets are free and incentives are right, people can find ways to solve their problems,” is hypocritical (Banerjee, Duflo, 20), since the poverty, for example, of regions with historically “bad” and “ugly” colonial activities are 30% and 15% lower than those with “good” colonial activities, respectively (Bruhn). Planetary concerns, including climate change, ozone depletion, environmental destruction, and rising sea levels, are pivotal in encouraging a modern agricultural revolution, particularly in remote regions or nations where compliance with ancient practices remains the norm, resulting in modern concerns such as a salinity crisis; Bangladesh, with appropriate investment, incentivization, governance, and international cooperation, can employ a combination of familial practices and the scientific advancements pioneered by Dr. Norman Borlaug, specifically privatized microfinance institutions to incentivize intrusion preventative species.

As delta countries throughout the Asia-Pacific region continue to experience the adverse effects of climate change, their geographic proximity to the ocean causes their traditionally freshwater sources to derive both water and sediments from it, via the environmental phenomenon addressed as saltwater intrusion. Consequently, river water is increasingly saline, and political conflict limits the adoption of diverse pathways due to stringent border restrictions, eventually causing the soils that support various agricultural economies, and, microeconomically, individual farms, to become more saline, and stimulating economic failure, food insecurity, agricultural crises, and ethno-racial conflict in these countries, which prominently include Australia, Bangladesh, China, Fiji, India, Iraq, Nepal, Malaysia, Pakistan, and Thailand (Australian Centre for International Agricultural Research).

Particularly in Bangladesh, a country plagued by governmental corruption, poverty, an astoundingly young population of 159 million with a population density of 1050 per km, the absence of modern medicine, and a refugee crisis, addressing saltwater intrusion may revamp the potential of each of these concerns (Muhammad). Such salinity exposure culminates in economic failure, with agriculture

constituting 14.2% of the \$261.5 billion GDP (CIA World Factbook), and public health crises, with people exposed to slightly saline (1000-2000 mg/l) and moderately saline (≥ 2000 mg/l) concentration drinking water having a respectively 17% ($p < 0.1$) and 42% ($p < 0.05$) higher chance of being hypertensive than those who consumed freshwater (< 1000 mg/l) (Al Nahian). Atop this, the absence of public healthcare or governmentally issued medical programs to mediate these circumstances is causing attendees of private hospitals to face issues such as a lack of safety or quality regulation, increased longevity, and undesirable rural-urban population distribution, with 63.4% of the population residing in rural Bangladesh (Hashim).

Because of the nature of the plant *Panicum virgatum*, or switchgrass, as a halophile, or an organism that, unlike most organisms, has the capacity to thrive in saline environments, its consumption patterns decrease the salinity of its surrounding environment, and its root infrastructure may be employed as a filter between saline freshwater and the soil on farms; therefore, a native halophilic species could theoretically be employed, following further field investigation to produce a transformative barrier, an effective filter, of halophilic plants. *P. virgatum* consumes 28.5 to 35.7 g N m⁻², 2.52 to 3.48 g P m⁻², and 29.6 to 38.4 g K m⁻² and thrives in both freshwater and wastewater treatments, making it an effective solution in any environment, both developing and developed (Ganjegunte). Similarly, it may be observed in the plant *Brassica napus* that increasing solution boron concentrations from 0.1 to 26.5 μ M increased relative boron uptake rates from 0.005 to 0.1 μ mol g⁻¹ root f wt d⁻¹, reflective of similar behavior in *P. virgatum* (Asad). As such, repeated scientific investigation and comparative analysis of similar plant physiology conclude that *P. virgatum*, when cultivated alongside saline water sources, alleviates the impact of salinity on agricultural institutions and laborers, as the derivative of salinity absorption is proportional to salt concentration.

The creation of a transformative barrier of halophilic plants requires manual labor, which may employ Rohingya refugees, permit the gradual mitigation of cultural premonitions, and restrict child sex trafficking (Beech). Engendering a newfound job market to provide employment for the Rohingya may be the sole method to legitimization of illegitimate children, since Bangladesh solely recognizes citizenship by descent, not birth (CIA World Factbook), resulting in 60 stateless Rohingya babies born each day in the country (Strochlic).

Financially, encouraging the implementation of a boundary based treatment is systematically inefficient, as, in fractal analysis, a decrease in patch size entails an increase in the perimeter-area ratio (University of Massachusetts); therefore, in a nation with an astoundingly young population of 159 million and a density of 1050 per km, with 63.4% residing in rural areas and agriculture constituting 14.2% of the \$261.5 billion GDP, an average holding size of 2.59 acres, and only 2.6% of farms having a land holding, the employment of legal boundaries in denoting location of treatment would be inefficient as the perimeter is exponentially high and equivalent subsidies would fundamentally be a government stimulus package, one inappropriate from a Keynesian perspective given the state of the country's economy (CIA World Factbook). The opposing approach, of communal halophilic boundaries against salinity intrusion, is not only logistically difficult to implement but also susceptible to the Tragedy of the Commons; therefore, the sole remaining solution, of employing integrated practices, relies upon the

utilization of one-acre farming technologies similar to those pioneered by Dr. Emma Naluyima in Uganda, specifically in the integration of pisciculture, through the controlled flooding of limited land holdings, divided as though paddy fields, in coalition with aquaculture, via hydroponics, of both halophiles and consumable crops (Naluyima). Considering that fish accounts for 60% of animal protein intake in Bangladesh, with an average consumption of 19.71 kg/person/year (WorldFish), but the industry is increasingly both damaged and damaging the environment due to an inability to proceed throughout seasonal monsoons, rising sea levels, and salinity intrusion as ancient practices dictate, integrated farming could significantly increase the sustainability of the nation, particularly when implemented in coalition with traditional floating farms (Myles).

Funding, however, remains a concern, but complying with the principles of Nachiket Mor, former vice president of ICICI bank, in requesting postmarked checks for agricultural loans, that bounce in the absence of repayment, will simply amount to failure; rather, the utilization of Bangladesh Nobel Peace Prize laureate Muhammad Yunus's principles in microfinance institutions (MFIs) and the practical experiences of Spandana-founder Padmaja Reddy can effectively guide government subsidies, instead of simply private loans, as is currently the case. Having derided traditional usury, Yunus prefers to build contracts involving "loans to a group of borrowers, who are liable for each other's loans and hence have a reason to make sure that others repay," preventing default by the "power of shame" instead of physical threats (Banerjee, Duflo, 276-300). To incentivize the cultivation of an edible but scarcely profitable crop, due to cultural institutions, the governments of these nations and the international community may employ agricultural subsidies, in a per capita or per unit method. While subsidies have the potential to hinder pure capitalism and the free market, by debilitating economic mobility in agriculture, it can stimulate economic stability and ascertain a stable food supply, entailing the development of human rights, as opposed to global dominance. Agricultural funding has remained a critical component of both economic policy and political appeal in agriculturally dominant economies such as Australia, with agriculture constituting a critical 3.9% of the Australian GDP of \$1.248 trillion, totaling an astounding \$48.7 billion (CIA World Factbook). When environmental factors, such as droughts, affected farms negatively, Australian politicians utilized their legislative perspective to gain unity among their voter bases and seek governmental unity in the country – by establishing low-interest loans, subsidizing transport costs, and initiating legal, cash-based payments to farmers, gaining unity among their voter bases in the process (Thomas).

The most significant causes of political instability in Bangladesh include political crime, deteriorating law and order, a lack of human rights or good governance, hampered economic growth, a lack of smooth process for handover of power, the absence of a coherent research/education budget, and income inequality. The drastic nature of political divisions are veiled by severe uncertainty and apathy from the people, for a nation so ridden with income inequality bears a populus more concerned with the stability of their jobs and the food on the table, while the government is detached from these social crises, and 66.7% of the educated attribute political instability to corruption most prominently. Effectively, the nation is trapped in an irrevocable cycle of instability, driven by party politics, in an irreconcilable battle between the incumbent party, in their struggle to retain power, and the opposition, in obtaining power; however, in their internal government battles, they unfortunately neglect the plight of the people, or the opportunity for political prowess within the aforementioned power struggle itself thereby entailed, with newfound opportunities for further cooperation thereof. (Rahman, Rashid)

Government assistance might be hindered by the inherent nature of the Bangladeshi government, since, unfortunately, despite Bangladesh's proclamations as democratized, Prime Minister Sheikh Hasina Wajed's Awami League party maintains power by stifling the opposition electorally (BBC). This entails inefficiency in legislative and economic enforcement; for example, while the country has an established minimum marriage age of 18 for girls and 21 for boys, this is not appropriately enforced, and underage, illegal marriages are common and culturally accepted (Williams). Furthermore, the absence of transparency in project origination and organization, specifically project appraisal, selection, design, and budgeting, when co-financed by allied governments or development finance institutions (DFI) tend to cultivate corruption risks such as money laundering in final project stages (Sobjak).

Because augmented taxation in such an impoverished land is an impossibility, international infrastructure investments are required to provide these subsidies as incentives; however, Greece continues to exemplify the failures of the International Monetary Fund (IMF) so perhaps the path of Southeast Asia, based on bilateral negotiations, is superior to follow (Oxenford). Theoretically, these practices could be implemented via the systematic subsidization of family farms, monetarily acquired from bilateral international initiatives, such as the Belt and Road Initiative (BRI) (Goodman); practically, the COVID-19 outbreak (Boo); global fears of debt-trap diplomacy, boiling a cauldron of angst and distrust among international leaders; and the realistic potential for corruption and long-term dependence defeat the viability of such proposals (Claus).

MFIs, in their modern privatized sense of the "big six" — Unitus, ACCION International, Foundation for International Community Assistance (FINCA), Grameen Foundation, Opportunity International, and Women's World Banking — are most efficient, yet often self-interested; non-governmental organizations, or NGOs, such as Spandana, are modest and community-minded, yet inefficient, despite India's designation of microfinance as a "priority sector" (Banerjee, Duflo, 283-300) Because privatization does not serve public interest, excepting in cases of ascertaining optimal market output, and public/philanthropic organizations are inherently inefficient, neither extreme is optimal, but an independent MFI, similar to the NGO operations of Spandana, though not optimal, could maximize efficiency and reduce corruption if it undertakes systematic investment, particularly considering that local involvement in the construction of necessary infrastructure (e.g. roads and bridges) can be pivotal in improving worker productivity and alleviating social inequality, as evidenced by the efforts of the Bangladesh Rural Advancement Committee, or BRAC (BRAC). Government subsidies would continue to be employed, channelled via the MFI and the local population to counter corruption, funding non-excludable and non-rival public goods, such as roads and schools, that produce positive externalities but no profit, and hence are not viable for private investment; more specifically, institutionalized mechanisms must be introduced to identify, disseminate, and evaluate promising innovations in real time; revisit the role of digitalization and IT in reaching scale during crises; differentiate responses between developing countries and high-income economies; recognize sector specificities (e.g. restructure value chains, support rural enterprises, assist rural poor); and incentivize aid agencies and implementing organizations to adapt (Cooley).

The creation of asset-backed securities, as an improved version of the creators of the 2008 crisis, could form a mechanism for safe private household, rather than corporate, investment in impoverished regions, effectively recreating the concept of stock market baskets for family farms, where the profit margin might be low, but the risk is low and potential high, due to the catch-up effect. Because, by inherent principle of MFIs, a single default ruins all possibility of future loans, the lending procedure is nearly perfect in safety, and borrowers and their respective loans may be graded based on time in program, producing AAA, AA, and A grade securities for long-term to short-term MFI villages respectively. As Ester Duflo and Abhijit Banerjee elaborate, the reason why upper-middle class families in developed nations tend not to donate for the resolution of the poverty problem is because they believe “[their] contribution would be a drop in the bucket, and the bucket probably leaks.” By instituting an effective version of the stock market with complete transparency on profits and the employment of money, with hefty personal monetary returns for contributing to the resolution of the crisis, donation would be both incentivized and encouraged, since “people are more likely to donate money to an identifiable victim than when presented with general information” (Banerjee, Duflo, 283-300).

In attempting to enhance economic growth and success, private interests, such as Shell, Philips, BASF, and Toyota, are increasingly incorporating corporate sustainability into their business strategies; therefore, while MFIs have viable returns in practice, their inability to meet theoretical, predicted efficiency dissuades their implementation, and the employment of supply chain finance, or that the high creditworthiness of a manufacturer can provide a raw material supplier with low creditworthiness a loan at a low interest rate, operates flexibly and well even under the behavioral constraints of Game Theory, specifically manufacturer Stackelberg and vertical Nash game. Under these circumstances, the manufacturer’s interest rate has a decreasing effect on the investment level of corporate responsibility and increasing effect on the profit margin; therefore, the manufacturer’s interest rate has a positive influence on the manufacturer’s margin under manufacturer Stackelberg. Game Theory further concludes that regular, privatized MFIs, wherein loaning is conducted via the derided asset-backed securities, may increase efficiency via incentives, specifically opting for positive, not negative, incentives (Jaehun, Vittaldas). Classical economics assumes that compliance with private interests ultimately results in maximized efficiency — market equilibrium; however, in the face of positive externalities, such as the positive social impact from the cultivation of intrusion preventative species in riparian zones in increasing soil productivity, wherein marginal social benefit is greater than marginal private benefit, a market failure occurs, and the market itself, when compliant with private interests, is inefficient. Such market failures may be translated and applied to the loanable funds market due to derived demand, and farmers are unlikely to meet the marginal social benefit of loans to cultivate intrusion preventative species; however, *Poor Economics* elaborates that even when an operation with significant social benefit, such as insecticide-treated bed nets, are subsidized to the point of being free, people are not dissuaded from future purchases; rather, even the impoverished become accustomed to the luxury of the free good and realize its benefits in application, thereby increasing marginal private benefit, or simply market demand, to the marginal social benefit and correcting the market failure (Duflo). Therefore, an initial iteration of subsidized intrusion preventative species, or related loanable funds, are required to incentivize future productivity and related increases in market demand.

The tale of Farzhana Akhtar Mili, a sari-clad woman from Chamta, Manikganj, Bangladesh, sitting on the brick steps affront her modest family home, differs quite significantly from the traditional story regarding poverty and its treatment of women: “We make up half the population of the village, so we have an equal say in what goes on here...A child marriage was happening in the village. I tried to talk Polly’s parents out of it, but they were adamant...With the help of the police, we are stopping child marriages”; evidently, the solution to domestic concerns need not be implemented massively, but local developments bear a tendency toward greater efficiency, particularly in rural areas, in the absence of governmentally induced corruption or basic infrastructure (BRAC). In a nation grappling with a corrupt government, debt-trap unilateral investment, inefficient multilateral negotiations, impertinent NGOs, a lack of upper-middle class donations, climate change, and poverty, salinity intrusion seems impossible to resolve, but, by constructing an NGO MFI, with meager affiliation with the government, there exist opportunities to escape this vicious cycle, with Farzhana’s grassroots hope for all.

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