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Development and Dissemination of Clean Cookstoves: A Model Law for Developing Countries*

**Principal Editor:
Lakshman Guruswamy****

* This model law was developed at a legislative drafting workshop on July 12-13, 2012, entitled Drafting Model Laws on Indoor Pollution for Developing and Developed Nations, which was sponsored by the Center for Energy & Environmental Security and the *Colorado Natural Resources, Energy & Environmental Law Review* at the University of Colorado Law School in Boulder, Colorado.

** Lakshman Guruswamy is the Nicholas Doman Professor of Law and the Director of the Center for Energy & Environmental Security at the University of Colorado Law School in Boulder, Colorado. He is indebted to Genevieve Smith and Lindsey Ratcliff for their invaluable help and assistance.

MODEL LAW

Be it enacted by the [legislative organ] of the [name of country] assembled,

Effective Date. This Act becomes effective on [date].

§1. Findings

(a) [Name of country] is a member of the community of nations that has accepted well-recognized principles of international law and policy establishing the right of developing countries to sustainable development.

(b) [Name of country] seeks to support sustainable development pertaining to energy poverty and access to safe and sustainable cooking technologies through this Act.

(c) According to the World Health Organization, approximately 3 billion people—nearly half of the world's population—cook their food over open fires or with inefficient, polluting, and unsafe cookstoves that use firewood, dung, or coal as fuel.

(d) Nearly 2 million people each year die prematurely from illnesses attributable to indoor air pollution resulting from inefficient, unsafe cookstoves. Indoor air pollution accounts for more deaths yearly than malaria, tuberculosis, or human immunodeficiency virus infection/acquired immunodeficiency syndrome (HIV/AIDS).

(e) [N, number of people] in [name of country] cook their food over open fires or with inefficient, polluting, and unsafe cookstoves that use firewood, dung, or coal as fuel.

(f) It is estimated that smoke from cooking accounts for nearly [N, number] deaths annually in [name of country], which is more than the deaths from malaria, tuberculosis, or human immunodeficiency virus infection/acquired immunodeficiency syndrome (HIV/AIDS). [N, number] are sickened by the toxic smoke and [N, number] suffer burns annually from open fires or unsafe cookstoves. Smoke from these traditional cookstoves and open fires is associated with a number of chronic and acute diseases, including respiratory illnesses, such as pneumonia, heart disease, and cancer. Women and young children are affected disproportionately.

(g) Women and children disproportionately shoulder the burden of collecting and managing biomass fuel for cooking. As nearby fuel supplies dwindle, women are forced to go farther to find fuel to cook their families' meals. In some regions, women and girls risk rape and

other forms of gender-based violence during the up to 20 hours per week they spend away from their communities gathering firewood.

(h) Recent studies show that black carbon created by biomass cookstoves significantly contributes to global warming and climate change. Black carbon emissions from residential cookstoves in developing countries account for an estimated 21 percent of the total global carbon inventory and mitigation of black carbon is a cost-effective way of addressing global warming.

(i) Clean cookstoves positively impact the quality of life and the environment by:

- (i) Freeing women and children to engage in educational and economic endeavors;
- (ii) Promoting gender equality and women's empowerment;
- (iii) Improving child and maternal health and safety;
- (iv) Advancing environmental stability by reducing reliance on biomass; and
- (v) Reducing contributions to global climate change.

§ 2. Policy

The House of Parliament hereby declares it is the national policy of [*name of country*] to:

(a) Appropriate financial resources towards the research and development of the most appropriate and sustainable energy technologies for improved cookstoves that advance the objectives of this Act in [*name of country*];

(b) Encourage the growth of a domestic cookstove manufacturing industry by supporting entrepreneurs through tax incentives, loans, and micro- and other forms of financing that advance the objectives of this Act;

(c) Standardize, test, and certify all cookstoves based on ambient and durability standards;

(d) Distribute cookstoves in a manner that emphasizes accessibility while encouraging the recipient to contribute to the cost in currency, exchange, and/or sweat equity;

(e) Encourage community participation in financing, manufacturing, distributing, and promoting the objectives of this Act;

(f) Seek the assistance, expertise, guidance, and experience of non-governmental organizations (NGOs) and faith groups in all aspects of the implementation of the Act;

(g) Promote awareness and education about indoor air pollution;

(h) Promote the involvement of cookstove users, *inter alia*, in the research, design, development, manufacturing, distribution, monitoring, maintenance, evaluation, and marketing of cookstoves; and

(i) Conduct training on use and maintenance to cookstove users and community members.

§3. Definitions

For the purposes of this Act:

(a) "Administrator" means the Administrator of the Cookstoves for the Reduction of Energy Poverty Agency (CREPA).

(b) "Agency" means the CREPA.

(c) "Cookstove" refers to a cookstove that:

(i) Employs appropriate sustainable energy technologies; and

(ii) Has been prototypically demonstrated, tested, and certified as meeting the emission and durability standards set out in Section 4.

(d) "Certification" or "certified" refers to certification by an entity or organization authorized by the CREPA.

(e) "Local conditions" means the holistic assessment of economic factors (ability to pay), cultural factors (willingness to change cooking patterns and behavior), and social factors (who the primary decision-maker in the household is, who is affected most by indoor air pollution, and who the primary social agents in the community are).

(f) "Organization" means an entity other than a governmental body, which was established or organized for any purpose relevant to this Act. This term refers to, *inter alia*, a corporation, company, guild, association, partnership, NGO, faith-based organization, trust, or trade union.

(g) "Endangerment" means the exposure, whether consented, voluntary, knowing, or without consent and involuntary, of individuals to conditions harmful to their physical health or the misrepresentation that certain harmful effects will in fact be reduced or removed by the actors' conduct.

(h) "Micro-financing" refers to loans which are granted for design, production, marketing, distribution, sale, maintenance, and repair of cookstoves.

(i) “Sweat equity” refers to the labor, skill, goods, or community services offered by recipients, in part or in full, for cookstoves. Sweat equity shall be transferable among households. The following activities shall qualify as sweat equity under this Act:

- (i) Labor provided in building or retrofitting cookstoves;
- (ii) Transportation of materials for new or retrofitted cookstoves;
- and
- (iii) Participation in public education and community outreach.

§ 4. National Minimum Standards and Certifications

(a) Indoor Ambient Air Quality Standards

The term “indoor ambient air quality standards” means airborne pollution measurements that do not exceed the following:

- (i) For particulate matter of 10 μm (PM_{10})—
 - (1) A 24-hour mean of 50 $\mu\text{g}/\text{m}^3$; or
 - (2) An annual mean of 20 $\mu\text{g}/\text{m}^3$.
- (ii) For particulate matter of 2.5 μm ($\text{PM}_{2.5}$)—
 - (1) A 24-hour mean of 25 $\mu\text{g}/\text{m}^3$; or
 - (2) An annual mean of 10 $\mu\text{g}/\text{m}^3$.
- (iii) For carbon monoxide (CO)—
 - (1) 100 mg/m^3 during any 15-minute period and not more than 1 time per day;
 - (2) 35 mg/m^3 during any 1-hour period and not more than 1 time per day;
 - (3) An 8-hour mean of 10 mg/m^3 ; or
 - (4) A 24-hour mean of 7 mg/m^3 .
- (iv) For nitrogen dioxide (NO_2)—
 - (1) A 1-hour mean of 200 $\mu\text{g}/\text{m}^3$; or
 - (2) An annual mean of 40 $\mu\text{g}/\text{m}^3$.

(b) Interim Standards

The Administrator, acting upon reasonable grounds, may determine that the standards in Subsection (a) above cannot be achieved, and s/he may create interim standards that improve existing air quality, even if they are unable to meet the standards in Subsection (a). Such interim standards may be in force for 2 years, provided they are no longer in force 5 years after the coming into force of this Act.

(c) Durability Standards

The Administrator shall establish minimum durability standards based on needs and conditions of the country, taking into account standards stipulated by the Global Alliance for Clean Cookstoves when available.

(d) Testing And Certification

(i) All new cookstoves and/or component parts, including combustion chambers, chimneys, and cooking tops sold and/or marketed under this Act in [*name of country*] shall be tested and certified.

(ii) Testing and certification will be undertaken by approved private, public, or NGO owned and operated laboratories. Certification will attest that the products are capable of achieving the ambient air quality and durability standards referred to in this Section.

(iii) The Administrator will approve such laboratories based on relevant criteria to be determined after a public hearing, and shall publicly announce and publicize such standards.

§ 5. Administrative Discretion

The Administrator, acting on reasonable grounds, which shall be determined after public hearing, may postpone and/or phase in the implementation of this and other provisions of the Act for a period that shall not exceed 5 years.

§6. Establishment of Agency

The Cookstoves for Reduction of Energy Poverty Agency (CREPA) is hereby established to implement the provisions of this Act. The Administrator of the Agency shall administer this statute by, *inter alia*:

(a) Conducting Needs Assessments and Developing Specifications

Within 120 days of the adoption of this Act, the CREPA shall deploy [*N (the number of provinces or sub-national governments)*] provincial assessment officers (PAOs), one in each of the country's [*N*] provinces. PAOs shall, in collaboration with [*name of appropriate NGO*] and local health personnel, conduct needs assessments that will identify and investigate:

(i) Types of fuel and cookstoves being used in their respective region for cooking;

(ii) Local exposure to indoor air pollution from existing cookstoves;

(iii) The needs and receptivity of the population to new cookstoves;

(iv) Possible cultural or geographical barriers to the adoption of new cookstoves;

(v) Environmental degradation and challenges to community;

(vi) The infrastructure of the areas assessed;

(vii) The financial status of the communities;

(viii) The high density of children; and

(ix) Provincial targets for the combustion efficiency of cookstoves, based on the minimum standards in Section 4(a) and local conditions.

(b) Cookstove Selection

CREPA, in collaboration with the Minister of Energy and the PAOs, will select cookstoves that culturally and economically suits the [*name of country*] and the type of biomass fuel used.

(c) Targeted Installation of Cookstoves—Pilot Programs

The PAOs, under the direction of the Administrator of CREPA, shall carry out pilot programs in each province, which can be replicated in the rest of the country for the purpose of identifying the challenges of creating a stove selection process, and implementing a national cookstove program. The communities selected for the pilot programs by the Agency shall be ones in which:

(i) Biomass is the sole method for cooking;

(ii) Surveys and Needs Assessments, which are carried out by the PAOs, reveal that a large majority in the community want to participate in the Pilot Project;

(iii) There are between 100 and 500 homes;

(iv) Individuals are willing and able to provide sweat equity, currency, or exchange for the cookstoves; and

(v) The population is demographically representative of the [*number of people in the country*] people who rely on biomass for cooking and are representative of the varying types of biomass fuel used in the region.

(d) Completion and Review of the Pilot Projects

(i) At least two Pilot Projects shall be completed within targeted communities for each province or biomass fuel type region before the widespread installation of cookstoves among the rest of the province population. The data revealed by each Pilot Project and the lessons learned shall be analyzed and reviewed in a Pilot Project Report.

(ii) If there is different fuel use or cooking methods in the province, separate Pilot Projects will be constructed and implemented in the areas to accurately determine the best clean cookstove.

§7. Implementation and Administration

(a) Implementation

The Administrator shall use the information revealed by the Pilot Projects to inform and implement this Act by:

(i) Consulting and collaborating, with the Ministers of (1) Health and Human Wellness, (2) Energy, (3) Environment & Natural Resources, (4) Education, and (5) Industry & Commerce, and within reasonable time constraints, receive their inputs.

(ii) Encouraging public participation in the implementation of the provisions of this Act, by incorporating:

(1) Notice and comment prior to the adoption of any major rules implementing the provisions of this Act, as governed by the [*name of country's administrative procedure act*];

(2) Open meetings whenever the CREPA has a quorum present for a meeting in which the CREPA discusses any regular business of the agency concerning this Act; and

(3) A community liaison in all aspects of implementation of the Act.

(iii) Where appropriate, seeking international aid and assistance in the form of technological assistance and expertise for monitoring and evaluation from, *inter alia*, inter-governmental organizations, other states, NGOs, faith-based organizations, corporations, private individuals, and charitable trusts.

(iv) Establishing a nationwide program to train the citizenry on the design, production, marketing, distribution, sale, maintenance, and repair of cookstoves.

(v) Using innovation, appropriate sustainable technologies, and/or techniques that provide greater economic benefits, all at a limited cost to the end-user.

(vi) Utilizing technologies and organizational methods, which have been successfully tried, tested, and demonstrated by other developing countries.

(vii) Using sweat-equity or exchange as a method for paying for the cookstoves.

(viii) Using comprehensive, holistic, cross-sectorial planning to capture the complexity of the cookstove initiative.

(ix) Seeking to establish in-country networks for the design, manufacture, marketing, and technological assistance of the cookstoves.

(b) Strategic 5-Year National Cookstove Plan (5-Year Plan)

After a widespread, open, and public consultation process, the CREPA shall draw up renewable strategic 5-Year Plans with annual targets and objectives that shall be publicly announced and publicized. The first Plan shall be completed within one year of the coming into operation of this Act. Once a 5-Year Plan has been completed, the CREPA shall issue annual reports that are announced and publicized on the actions taken pursuant to the 5-Year Plan and the extent to which the targets or objectives have or have not been met. The annual reports will be reviewed annually by the Parliament of [name of country].

(c) Stimulate the Cookstoves Industry and Markets

The CREPA shall stimulate and encourage the creation of a robust domestic cookstove industry, by engaging, *inter alia*, in the following:

(i) Improving access to capital by providing tax incentives and loans and removing restrictions on foreign investment in the cookstove industry;

(ii) Establishing certification and standardization protocols for cookstove parts and equipment; and

(iii) Collaborating with the Ministry of Energy to disburse grants for research and development to qualified universities in [name of country], which are able to undertake research and development.

(d) Monitoring and Inspection

Through collaboration with PAOs, the Administrator shall, with immediate effect, begin the following activities towards implementation of this Act:

(i) *Assessment*. Quantitative monitoring of the ambient air quality of representative samples of existing homes before the installation of improved cookstoves.

(ii) *Post-Installation Air Quality Monitoring*. Quantitative monitoring of the ambient air quality of the homes referred to in Section 6(c) above after improved cookstoves are installed within the following time-frames:

- Phase 1—within 1 year of installation;
- Phase 2—within 18 months of installation;
- Phase 3—within 3 years of installation; and
- Annual monitoring once every year, thereafter.

(iii) *Use Monitoring*. Inspecting installed cookstoves to ensure they are being used and are working properly.

(iv) *Reporting*. Submitting to Parliament a report (Administrators Report) on the findings of the monitoring and inspection efforts under this Section, 2 years after this Section comes into force and annually thereafter.

§8. Authorization and Appropriations

[*Appropriated amount (USD or national currency)*] shall be authorized and appropriated every year, beginning in 201[], continuing for the next 5 years, and allocated as follows:

(a) [*Appropriated amount (USD or national currency)*] to the Administrator for the administrative costs of implementing this Act.

(b) [*Appropriated amount (USD or national currency)*] to a grant and loan mixed funding mechanism, which is administered by the CREPA and encourages entrepreneurship and creates new markets by stimulating the large-scale manufacture and distribution of improved cookstoves.

(c) No grant shall be made under this Section unless 75 percent of the products, materials, and supplies have been mined or manufactured in [*name of country*]. This Section shall not apply where the Administrator, after reasonable consideration of relevant factors, including cost, efficiency, availability, and international agreements, determines that it is in the public interest to waive this requirement, either generally or with regard to specific materials.

(d) [*Appropriated amount (USD or national currency)*] for NGOs, such as, but not restricted to [*Appropriate NGO*], if they can provide matching funds on a 1:4 ratio (match 1 USD provided in this Section with 4 USD of their own) for carrying out education and awareness campaigns and monitoring of indoor air pollution.

(e) [*Appropriated amount (USD or national currency)*] to the Ministry of Energy to administer a program for the research and development of appropriate cookstoves. The appropriated amount shall remain available until expended.

(f) [*Appropriated amount (USD or national currency)*] to the Ministry of Health on an established needs basis.

§9. Research and Development

The Minister of Energy is authorized to conduct, promote, coordinate, and accelerate research, development, studies, surveys, experiments, demonstration projects, and training related to:

(a) The development and application of cooking technologies that provide effective and efficient alternatives to open-fire biomass,

including alternative fuels and efficient cookstoves that meet and exceed the minimum standards set out in Section 4 and which maximize the use of local materials; and

(b) Health and safety in the application of such technologies, methods, and means.

(c) The Minister of Energy will actively solicit foreign aid, assistance, and collaboration in carrying out research and development from other governments, intergovernmental organizations, multinational corporations, NGOs, scientific bodies, and any other entities that will support objective scientific research and development.

(d) Prioritization

In conducting the activities authorized by this Section, the Minister of Energy may enter into contracts with and make grants to, qualified institutions, agencies, organizations, and persons. Priority shall be given to:

(i) The [*appropriate scientific or academic institution in country*];

(ii) Other public or private institutions that are scientifically equipped to conduct the required research; and

(iii) Other organizations that are equipped to create appropriate educational campaigns and workshops to engage communities and individuals.

(e) Availability of Information to the Public

Subject to the patent provisions of the [*name of country's patent act or other intellectual property law*], all discoveries, inventions, innovations, information, and data resulting from any research studies, surveys, experiments, assessments, or demonstration projects conducted or financed under this Section shall belong to the public domain and be available to the public for their use without charge.

§10. Education and Information

(a) The Ministry of Health shall be responsible for educating the public on the dangers of indoor air pollution. The Ministry of Health shall utilize existing health education channels to inform the public, including, but not limited to: (1) rural and urban hospitals and clinics; (2) school health awareness programs; (3) churches and other places of worship; (4) community leaders, including chiefs, faith leaders, and midwives; and (5) mass media forums, including radio, television, and cellular phone messaging.

(b) The Minister of Health shall have final authority over all private programs for the dissemination of information to the public and shall

exercise discretion in determining the appropriateness of the message communicated under programs governed by this Act.

(c) The Minister of Health shall approve the health-science aspect of marketing materials to ensure that only verifiable findings of Parliament are used to convey the nature of the problem.

§11. Public Health

The Minister of Health shall encourage early treatment of signs and symptoms of respiratory problems. To this end,

(a) Healthcare workers will report specific cases of respiratory illnesses, by creating individual records of patients and monitoring their treatment;

(b) Data on respiratory illnesses will be shared with the Administrator in accordance with the mandate of this Act under Section 10; and

(c) The Minister of Health will enlist the help of NGOs.

§12. Enforcement

(a) Civil Remedies

Non-compliance order. On the basis of information available to him/her, if the Administrator finds violations of this Act, s/he may issue a non-compliance notice to the identified party. Non-compliance orders may be issued by the Administrator for violations of this Act in accordance with [*name of country's administrative procedure act*]. In addition, the Administrator must:

(i) Issue a notice of the alleged violation to the offending party within 15 days of discovery of a violation;

(ii) Allow the offending party 10 days to rebut the evidence against him/her and submit to agency-inspected corrective measures; and

(iii) Institute immediate suspension of activities that have or are reasonably expected to impose a grave health risk to the population.

(b) Citizen Enforcement

(i) Any citizen or resident of [*name of country*] may seek judicial remedies under this Section for violations of any mandatory provision of this Act. These citizen suits may be lodged in any District Court against any government agency, department, or private party that violates or fails to carry out any mandatory provisions of this Act. Prior to bringing an action, a citizen shall:

(1) Give notice to the defendant agency, department, or private party about the alleged violation(s) of this Act; and

(2) Allow a period of 2 months after receipt of notice to enable the defendant to rectify the alleged violation(s) of this Act before filing a lawsuit.

(ii) If the Plaintiff is successful, the court may order the defendant to comply with the Act and award damages. A successful litigant is entitled to recover full costs and the court shall include and order such costs in its judgment.

(iii) In the event an action is dismissed, the court may, in its discretion, order the citizen plaintiff to pay the defendant such costs as it deems reasonable and necessary.

(c) Criminal Penalties

(i) *Violation of Non-Compliance Order.* Any person who fails to comply within 3 months of receipt of a non-compliance order issued pursuant to Subsection (a) shall, after due inquiry by a District Court, be punished by a fine of not less than 250 USD [*or other typical fine in national currency*] nor more than 2,500 USD [*or other typical fine in national currency*] per day per violation, or by imprisonment for not more than 1 year, or by both.

(ii) *Negligent Misrepresentation.* Any person who negligently represents that cookstoves meet the minimum national standards of Section 4 or regional standards established pursuant to Section 4(a)(viii) shall be punished by a fine of 1,000 USD [*or other typical fine in national currency*] per cookstove sold under negligent misrepresentation.

(iii) *Knowing Endangerment.* Any person who knowingly endangers another person or community of persons by manufacturing, marketing and/or distributing cookstoves, and/or other cookstove parts that do not conform to the provisions of Section 4 (or regional standards established pursuant to Section 4(a)(viii)) shall be subject to a fine of not more than 25,000 USD or imprisonment of not more than 15 years. An organization shall be subject to a fine of not more than 100,000 USD.

COMMENTARY

*Introduction*¹

The National Dissemination of Clean Cookstoves Act is a model law publicly made available for legislative adoption and enactment by developing countries committed to addressing the needs of the 2.8 billion people who lack access to clean energy for cooking. The model law initiative, and public offering, is based on a foundational jurisprudential premise that needs elucidation.

Jurisprudentially, law is a normative construct that can and should respond to social problems. Law is an “instrument,” “tool,” “machine,” or “engine” for serving or achieving social objectives, and achieving practical aims.² Robert Summers, in discussing the use of the machinery of law to achieve socio-economic objectives, saw it as a particularly American form of legal theory spawned by theorists like Oliver Wendall Holmes, Roscoe Pound, John Dewey, John Chipman Gray, Karl Llewellyn, Walter Wheeler Cook, and Felix Cohen.³ Summers coined the phrase “pragmatic instrumentalism” to describe how these theorists created a theory of adjudication⁴ focused on the role of judges in shaping and molding law to achieve social means or ends.

In fact, the use of law for social engineering has a much richer, more international lineage, traceable to the British philosopher, jurist, and social reformer Jeremy Bentham (1748-1832). Bentham, perhaps best known for his utilitarian philosophy, was also an English legal revolutionary who re-drew the contours of law. In doing so he recreated a vastly expanded domain of law, in a way that had not hitherto been done. He called for a complete, comprehensive, and integrated *legislative* re-envisioning of the existing system of law and government. Bentham expounded the necessity for a new “form” of law that laid the foundations of a reformed society, in which the “whole of the community’s social system no less than the community’s legal system was to be located analytically within the province of legislation.”⁵

1. This Subsection is based upon and reproduces parts of Lakshman Guruswamy, *Drafting Model Laws on Indoor Pollution for Developing and Developed Nations Workshop, July 12-13, 2012, Boulder, CO: Introduction*, 24 COLO. NAT. RESOURCES, ENERGY & ENVTL. L. REV. 319 (2013).

2. ROBERT SUMMERS, INSTRUMENTALISM AND AMERICAN LEGAL THEORY 20 (1982).

3. *Id.* at 11; *see generally id.* chs. 2 & 12.

4. MICHAEL S. MOORE, EDUCATING ONESELF IN PUBLIC: CRITICAL ESSAYS IN JURISPRUDENCE 194 (2000).

5. DAVID LIEBERMAN, THE PROVINCE OF LEGISLATION DETERMINED 287 (1989).

Moreover, he explicated how to design, draft, implement, and generally use legislation to achieve the social objectives of the new kind of law he was calling for. The vast and theretofore shapeless socio-political expanse envisioned by him had to be legislatively mapped and populated, and become part of a great reformist enterprise based on a new concept of law.

What we are trying to do in this model law is based on Benthamite jurisprudence. This draft model law could be enacted by the legislatures of developing countries while its companion model law could be enacted by developed countries.⁶ Legislatures enacting these model laws will be adopting problem-solving legislation within the compass of law envisioned by Bentham. For example, the model law for developing countries is actually a blueprint for the national dissemination of clean cookstoves. It embodies a carefully constructed socio-legal architecture ensuring that the national enterprise of installing cookstoves is successfully undertaken. Similarly, the model law for developed countries commits them to take practical steps to help developing countries and peoples with access to clean energy for cooking.⁷

Both developed and developing nations adopting a model law, or variations of it, will be using the machinery of law to achieve the compelling social objective of combating indoor air pollution and global warming. From a global perspective, the enterprise of law encompasses public international as well as national laws. When adopted or enacted, model laws will become municipal or national legislation, as contrasted to international treaties. The use of national legislation to address an international problem requires explanation.

Public international law is the law that creates and governs inter-state (or country) relationships, primarily through contracts called treaties, conventions, and protocols. It is possible for the 192 countries in the world to come together as a lawmaking assembly with a view to negotiating and drafting a global treaty to address indoor air pollution. This is what happened with climate change and biodiversity. But that is not the only way forward, and the international law approach to indoor air pollution could lead countries to enter into less ambitious regional multilateral treaties governing regions identified by trade or geo-politics. It is also possible for one country to enter into a bilateral agreement with another country. But given the ubiquitous nature of indoor air pollution, and the need for both developed and developing country responses, the

6. See generally Scott Miller, Principal Editor, *Development and Dissemination of Clean Cookstoves: A Model Law for Developed Countries*, 24 COLO. NAT. RESOURCES, ENERGY & ENVTL. L. REV. 355 (2013).

7. See *id.*

treaty or public international law track probably calls for a multilateral global treaty.

However, it is becoming evident that large international treaties or conventions of this kind are exceptionally difficult to negotiate, and even harder to implement and enforce. Despite tremendous diplomatic- and media-backing, the faltering negotiation of a treaty to replace the Kyoto Protocol is strong evidence that countries are backing away from large multilateral treaties. Moreover, the search for consensus between different legal traditions is not an easy enterprise. Some commentators claim that international treaties and conventions are inevitably and confessedly drafted as multi-cultural compromises between different schemes of law.⁸ Consequently they will normally have less merit than most of the individual legal systems from which they have been derived.⁹ In addition, the treaty making process is extremely time-consuming. It typically takes over a decade to advance from the agenda setting stage, via a framework agreement, to the negotiation of the first operational protocol for collective action.

Another way of looking at legal answers to a global problem is through the lens of domestic or municipal legal systems. The numerous developing and least developed countries in the world that are suffering from indoor air pollution could respond to it through domestic or municipal laws. Many of these countries have other pollution laws dealing with differing aspects of atmospheric pollution, water pollution, and hazardous waste. Such pollution control laws are enacted by national legislatures. What this model law seeks to do is to expand the vision of national pollution and health legislation by including indoor air pollution.

This model law generally fits within the framework of the United Nation's practice regarding model laws. As the United Nations Commission on International Trade Law describes:

A model law is a legislative text that is recommended to states for enactment as part of their national law. . . . A model law is an appropriate vehicle for modernization and harmonization of national laws when it is expected that States will wish or need to make adjustments to the text of the model to accommodate local

8. The process of consensus building by bridging non-cooperative attitudes, characteristic of global multilateral treaty-making, involves a great deal of ad-hoc log rolling.

9. J.S. Hobhouse, *International Conventions and Commercial Law: the Pursuit of Uniformity*, 106 L. Q. REV. 530, 533 (1990). Even after reaching agreement, ratification of the protocol requires governments to create consensus at the domestic level. In case a government turns out to be unwilling to ratify the protocol, there always remains the possibility that the whole negotiation process can unexpectedly be brought back to an earlier stage, causing considerable time delays.

requirements that vary from system to system, or where strict uniformity is not necessary or desirable. It is precisely this flexibility which makes a model law potentially easier to negotiate than a text containing obligations that cannot be altered, and can promote greater acceptance of a model law than of a convention dealing with the same subject matter. Notwithstanding this flexibility, in order to increase the likelihood of achieving a satisfactory degree of unification and to provide certainty about the extent of unification, States are encouraged to make as few changes as possible when incorporating a model law into their legal systems.¹⁰

Nationally, a model law¹¹ plays a critical role in shaping the thinking of a nation at many levels. It is a problem-solving mechanism that commits a country to address its own problem and take responsibility for doing so. There are some notable features in the present model law. First, it establishes governmental agencies, departments, and institutions that are funded by the government to combat indoor air pollution. This regulatory machinery creates the structure and foundation for future action. Second, it creates an essential blueprint for a viable cookstove industry. The model law contains provisions, *inter alia*, dealing with standards, certification, promotion of private enterprises, and opportunities for foreign investment and collaboration. Finally, the model law is backed by the organized power of the state that pulls toward compliance and pushes to implement its provisions.

A model law serves the self-interest of the developing country, while simultaneously advancing international comity and law. By adopting a model law, a developing country demonstrates its seriousness, good faith, and bona fides in promoting both sustainable development (SD), and the fight against global warming. Developed countries have assumed the primary international legal and political responsibility for addressing SD and global warming. Nonetheless, even well-intentioned developed countries remain skeptical about the concomitant commitment of developing countries to address SD and global warming. Adopting this model law helps to remove such doubts and assures developed countries that they can become jointly engaged and partner with model law countries in dealing with indoor air pollution and the reduction of black carbon. The model law will help dispel uncertainties about the regulatory and business environment of the model law country, and encourages decision makers in developed countries to more readily assume their

10. U.N. COMM'N ON INT'L TRADE LAW, A GUIDE TO UNICITRAL: BASIC FACTS ABOUT THE UNITED NATIONS COMMISSION ON INTERNATIONAL TRADE LAW 14-15 (2013), available at <http://www.uncitral.org/pdf/english/texts/general/12-57491-Guide-to-UNCITRAL-e.pdf>.

11. *Id.*

responsibilities to support model law countries. This can only lead to more aid and assistance, along with greater collaboration in research, development, and demonstration; more investment; and the creation of business opportunities.

At the level of comity and law, the adoption of model laws by a significant number of developing countries will have a beneficial impact on the global challenges posed by sustainable development and global warming. Model law nations will demonstrate how global problems could elicit national legal responses that avoid the arduous and problematic treaty process. They could pave the path for a different and perhaps easier way of responding to international environmental problems.

Section-by-Section Analysis

Section 1. Findings

The model legislation provides a series of findings and lays the foundation for establishing the programs described in the following sections. The findings are based on generally and internationally available evidence.¹²

Section 2. Policy

The policy articulated here is based on the premise that a comprehensive solution to the problem of inefficient cookstoves will involve needs assessments, scientific research and development, large-scale manufacturing, standardization and certification, private

12. See *Indoor Air Pollution and Health: Fact sheet No. 292*, WORLD HEALTH ORG., (Sept. 2011), <http://www.who.int/mediacentre/factsheets/fs292/en/> (Findings 3, 4 & 5); GLOBAL ALLIANCE FOR CLEAN COOKSTOVES, *IGNITING CHANGE: A STRATEGY FOR UNIVERSAL ADOPTION OF CLEAN COOKSTOVES AND FUELS* 10 (Nov. 2011), *available at* http://www.cleancookstoves.org/resources/fact-sheets/Igniting_Change.pdf (Findings 4 & 10); *Number of Deaths due to HIV/AIDS*, WORLD HEALTH ORG., http://www.who.int/gho/hiv/epidemic_status/deaths/en/index.html (last visited Mar. 5, 2013) (reporting that an estimated 1.7 million people died of AIDS related illnesses worldwide in 2011) (Finding 5); THE WORLD BANK, *HOUSEHOLD COOKSTOVES, ENVIRONMENT, HEALTH, AND CLIMATE CHANGE: A NEW LOOK AT AN OLD PROBLEM* (2011), *available at* <http://climatechange.worldbank.org/sites/default/files/documents/Household%20Cookstoves-web.pdf> (Findings 5, 7, 9); *The Issues: Health*, GLOBAL ALLIANCE FOR CLEAN COOKSTOVES, <http://www.cleancookstoves.org/our-work/the-issues/health-impacts.html> (visited Mar. 5, 2013) (Finding 6); U. N. WOMENWATCH, *FACT SHEET: WOMEN, GENDER EQUALITY AND CLIMATE CHANGE* (2009), *available at* http://www.un.org/womenwatch/feature/climate_change/downloads/Women_and_Climate_Change_Factsheet.pdf (Finding 8).

investment, public intervention to promote the creation of self-sustaining cookstove markets, monitoring and evaluation of installed cookstoves, and repair and support systems through the lifespan of the cookstoves. It also involves public expenditures, as appropriated under this Act, to address indoor air pollution, which is prioritized in three critical areas: (1) research and development; (2) incentivizing entrepreneurship; and (3) certifying and creating standards. The policy is expressed in generic terms and could be adopted to suit the particular circumstances of each country.

Section 3. Definitions

Many of these definitions are self-explanatory and simply explain terms and concepts in the model law. Needless to say, the adopting country will only use the definitions if the terms defined form part of the law being enacted by the adopting country. For example, it is possible that the adopting country does not propose to set up a Cookstoves for the Reduction of Energy Poverty Agency. If such be the case, there will be no definition of such an agency.

Section 4. National Minimum Standards and Certification

Actual ambient air quality minimum standards under Section 4 will be country specific, based on what the adopting country determines is achievable. The World Health Organization (WHO) ambient air quality standards should serve as a guide/goal. In this context, it is important to emphasize the crucial importance of these standards. The ambient emission standards relating to indoor air pollution require improvement in air quality by reducing the emissions from cookstoves. They obligate governments and administrative agencies to meet such standards. Apart from parliamentary oversight, the standards could also be enforced by citizen actions if the relevant government agencies fail to carry out their duties.

A major impediment to the widespread adoption of cookstoves at the global, regional, national, and sub-national levels lies in the absence of minimum standards. Manufacturing and durability standards promote safety, reliability, productivity, and efficiency in almost every industry that relies on engineering components or equipment. Practically, standards consist of a set of rules for ensuring quality and are set by a recognized standardization body. Technical standards involve technical definitions and specifications for products and processes. National and international standards for goods and services have become pivotal to businesses, markets, and trades of all descriptions, ranging from electronics to timber. Some types of standards are relied upon by vendors

and end users because they vouch for quality. For example, a durability standard that guarantees at least a minimum cookstove lifespan of two years assures the consumer or buyer that s/he is buying a product that will last two years and offers recourse against the manufacturer in case it does not. Minimum standards also promote investment in the manufacture of cookstoves. An investor needs to know that the product s/he is investing in can be marketed. A product meeting manufacturing and durability standards has greater potential for market receptivity and widespread sales in contrast to products that do not.

Overall, standardization brings important benefits to businesses, including a solid foundation upon which to develop new technologies and an opportunity to share and enhance existing practices. Standardization plays an important role, not only in promoting more business, but in advancing policy initiatives and understanding the place of regulation.

Section 4 also deals with certification. Product certification, undertaken by independent entities, is the process of certifying that a certain product has passed performance and quality assurance tests or qualification requirements and standards. Examples of certification include those found in the electronic, timber, forest, fishery, sanitation, medical, organic, and renewable energy industries.

Section 5: Administrative Discretion

This Section grants discretion to the Administrator, after due process and public inquiry, to adapt the standards and regulations to the compelling conditions of the country.

Section 6: Creating an Agency

The adopting country may not wish to establish a new agency for the reduction of cookstove pollution. Similarly, the adopting country may also not wish to create a new cadre of provincial assessment officials. While these choices clearly fall within the administrative governance of each adopting country, some of the other substantive goals set out in Section 6 are to be institutionalized as law by an adopting country.

Needs assessments are necessary to avoid a cookie-cutter approach to the promotion of cookstoves. Local needs assessments help to discover the local needs and conditions, and craft an area specific, bottom-up, rather than a top-down, cookstove program that addresses particular community needs.

Pilot programs are mini or scaled-down versions of a full-scale program. Pilot programs fulfill a range of important functions and can

provide valuable insights for assessing the feasibility of a full-scale program. They help to identify logistical problems, which might occur using proposed methods; estimate variability in outcomes; collect preliminary data; determine what resources (finance, staff) are needed for the full program; and assess the proposed programmatic techniques to uncover potential.

Section 7. Administration and Implementation

This Section refers to implementation by the Administrator of the new cookstove agency under Sections 6 and 7. The administration and implementation by the Ministers of Energy and Health are referred to in Sections 9, 10 and 11. As noted earlier, the adopting country does not need to create a new cookstove agency and could implement and administer this Act through its existing legal and administrative structures. Whether administered and implemented through a new agency or existing institutions, the adopting country should pay particular attention to the substantive components of this Section, which are discussed further in this Commentary.

First, the Strategic Plan envisioned in Section 7(b) institutionalizes the need for the new cookstove agency (or other existing organization of an adopting country) to define its strategy or direction and make decisions on allocating its resources to pursue this strategy. In doing so, the strategic planning process should keep in mind the pivotal objective of encouraging the creation of markets for cookstoves and ensure that planning is an instrument for generating cookstove markets. One aspect of this lies in creating standards and certifications. Second, public participation and consultation is important as part of bottom-up planning that incorporates the views of the people. Third, no cookstove scheme can succeed unless the indoor air quality and durability standards are monitored on an ongoing basis.

Finally, it is important to research and collect information about voluntary groups and trade associations dealing with the design, manufacture, deployment, or adoption of cookstoves. This is an attempt to discover if they participate in public relations activities, such as advertising, education, political donations, lobbying, organizing conferences, publishing, networking, holding charitable events, and offering classes or educational materials; and to discover any barriers that are currently keeping these groups from collaborating to produce standards and certifications.

Section 8. Authorization and Appropriations

This Section deals with authorization and appropriations for three administrative/governmental units: the new cookstove agency and the Departments of Energy and Health. The adopting country could change this to suit its own administrative structures.

What is critical is that the legislature authorizes and appropriates funds for the purposes referred to in Section 8, enabling the policy and purposes of the Act to be achieved. Section 8 discusses funds, including loans and other fiscal devices, to encourage cookstove markets and underlines the importance of promoting private investment and markets for cookstoves.

The incorporation of NGOs into the administration and implementation of the Act is based on compelling evidence that NGOs and other non-governmental entities are in many cases more effective and efficient distributors of goods and services than government agencies. It is clear that a number of NGOs are committed to addressing the problems of indoor air pollution and are a resource that should be utilized. Developing country governments should, through legislation, integrate these NGOs into their mission of alleviating indoor air pollution.

The dangers of indoor air pollution are often unknown and cookstove programs should be premised on awareness and information. As a result, the public health dangers of indoor air pollution must systematically and continuously be publicized. As such, the authorization and appropriation is for publicizing information about the serious hazards caused by indoor air pollution.

Section 9. Research and Development

The design and manufacture of cookstoves has attracted very little scientific funding. One reason for this lies in the perception that cookstoves and fuels for cookstoves embody "mundane" technology, as distinct from path-breaking scientific discoveries of the kind sought by the great scientific establishments of the world. There is no doubt that the great scientific institutions of the developed world should turn their minds and attention to the vital importance of designing and manufacturing effective, cheap, and durable cookstoves. The developing world would be in a much better position to attract scientific attention and funding by showing its own commitment and resolve to address this problem.

Section 9 places the prime responsibility for research and development on the Ministry of Energy and emphasizes the importance

of soliciting and attracting foreign funds and assistance. As in every other administrative allocation of duties, the adopting country is free to make its own arrangements, provided that the substantive importance of research and development is in fact institutionalized.

Section 10. Education and Information

The importance of communicating awareness and education about the dangers of indoor air pollution, and the availability of remedies like cookstoves, has been reiterated in this Commentary. This model law places primary responsibility on the Health Ministry to educate the public. As in all such allocation of duties, the adopting country can make its own administrative arrangements, provided it accepts the importance of and commits to promoting awareness and education.

Section 11. Public Health

This Section acknowledges the importance of treating the health problems caused by indoor air pollution. Section 11 requires public health officials to be aware of the health impacts of indoor air pollution and that such conditions need to be treated. In doing so, Section 11 attempts to integrate the largely ignored health hazards of indoor air pollution with other more recognizable ailments and conditions. Doing so brings indoor air pollution within the ambit of officially recognized public health problems and ingrains them within the minds of public health officials. The recognition of indoor air pollution by public health officials will have a conscious and unconscious impact on the general public who deal with such officials.

Section 12. Enforcement

Judicial and administrative enforcement is a necessary facet of the broader implementation of the Act. While civil and criminal enforcement by public officials is a familiar feature of the laws of many developed countries, the citizen suit provisions may need some explanation in the context of developing countries. In essence, a citizen suit is a form of private enforcement. With private enforcement, the private litigant steps into the public domain by calling for enforcement against the official enforcers or government agencies. For a variety of reasons, government agencies are often unable or unwilling to enforce regulatory laws. Regulatory agencies seem unable to act speedily and comprehensively to achieve the social goals committed to them for a number of reasons, four of which merit special mention.

First, they may be hobbled by inadequate staff and information. Second, agencies may be slow off the mark and playing catch up with changing circumstances. Third, they may be "captured" by the very groups they are supposed to regulate. Fourth, they could be ensnared in procedural red tape.

When armed with citizen suit authority, private citizens are enabled to take over the enforcement of such laws, free of some of the bureaucratic and political constraints that can hobble government enforcers. In the United States, environmental laws that allow citizen suits include the Clean Water Act; Safe Drinking Water Act; Clean Air Act; Resource Conservation and Recovery Act; Comprehensive Environmental Response, Compensation, and Liability Act; Surface Mining Control and Reclamation Act of 1977; Endangered Species Act; and the Emergency Planning and Community Right To Know Act

It is possible for some governments and their bureaucracies to consider citizen suits as potential instruments for attacking government institutions who are doing their best in difficult circumstances. They may also consider such suits a device for drawing national and even international attention to their country. From a more objective perspective, any government that enacts this statute is seeking to address the problems of indoor air pollution and should not try to cover up the poor conduct of their agencies. What a citizen suit does is to allow citizens of a country to draw attention to agency inaction and enables an independent judiciary to call for the implementation of mandatory and non-discretionary provisions of the Act. Bringing questionable conduct into the sunshine of judicial scrutiny will help governments meet the challenges they seek to address through this Act.