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**THE DANGERS OF BREATHING: INDOOR AIR  
POLLUTION'S IMPACT ON RURAL CHINA**

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I. INTRODUCTION

Imagine the sun slowly rising above quiet rooftops in rural China. Meanwhile, a mother toils in her kitchen. For the mother, the day officially starts when she lights the assorted combustibles beneath her cooking and heating stoves. The mother works with her little boy sleeping and

strapped on her back. Over many years, they will have spent much of their time breathing smoke that endangers their health.

### A. *Brief Statement of the Problem*

In rural China, indoor air pollution causes an estimated 110,000 premature deaths each year.<sup>1</sup> Women and young children spend on average three to seven hours of the day cooking and heating their home and suffer the most from indoor air pollution.<sup>2</sup> Currently, the governmental agencies that exert jurisdiction over Chinese environmental policies neglect rural areas.<sup>3</sup> This note proposes the creation of a new department within the existing State Environmental Protection Agency (“SEPA”) to set indoor air quality standards, monitor the implementation of such standards, and research alternative energy sources in rural areas.

### B. *Larger Context*

This section takes up the problem of indoor air pollution in a larger context. Although this note focuses on the narrow issue of the health effects of indoor air pollution on rural Chinese households, the following discussion provides helpful background because indoor air pollution not only affects impoverished households in rural China; it is also one of the main respiratory health issues in most developing countries. On a larger scale, indoor air pollution contributes to outdoor pollution and affects the global environment.

Poverty contributes to the behaviors that cause indoor air pollution. Rural Chinese households often cannot afford to obtain safer and more efficient fuels. For instance, while poor families often have access to electricity, they cannot afford to use the electricity for cooking or heating.<sup>4</sup> Nor can these families afford to purchase more efficient stoves or heaters to reduce the amount of pollution.<sup>5</sup> A comparison of fifty Chinese cities shows that the poor live with more pollution.<sup>6</sup> Wealthy areas provide stricter environmental regulations because these communities contain highly educated citizens who care about environmental problems. In contrast, the poor households of rural China remain unaware of the health-damaging pollutants emitted from their stoves.

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<sup>1</sup> TODD M. JOHNSON, FENG LIU, & RICHARD NEWFARMER, *CLEAR WATER, BLUE SKIES: CHINA’S ENVIRONMENT IN THE NEW CENTURY 2* (The World Bank 1997).

<sup>2</sup> World Health Organization, *Pollution and Exposure Levels*, at [http://www.who.int/indoorair/health\\_impacts/exposure/en/](http://www.who.int/indoorair/health_impacts/exposure/en/) (last visited Feb. 10, 2005).

<sup>3</sup> JOHNSON, *supra* note 1, at 13.

<sup>4</sup> J.R. Pegg, *Rural China Choking on Indoor Air Pollution*, (2003), available at <http://www.worldrevolution.org/article/861> (last visited March 9, 2005).

<sup>5</sup> *Id.*

<sup>6</sup> JOHNSON, *supra* note 1, at 13.

Dependence on biomass fuels, such as crop residues, dung, straw, wood, and coal also contributes to poverty.<sup>7</sup> The time spent on collecting fuels imposes an opportunity cost on the families from performing other essential tasks.<sup>8</sup> Instead of finding fuel, the family could pursue education or other income-generating activities.

Besides its harmful effects on health, indoor air pollution exacerbates the greater problem of China's outdoor pollution and deteriorates outdoor air quality. China's rural household energy use accounted for 24 percent of the country's total energy consumption in 1992.<sup>9</sup> Without a change in rural household practices, the amount of smoke emitted by the households is projected to grow by 90 percent between 1995 and 2020.<sup>10</sup>

Governmental programs focusing on improving the indoor air quality in large cities such as Beijing have brought about improvements to outdoor air quality.<sup>11</sup> However, no such programs have been introduced into rural communities.<sup>12</sup> To significantly improve outdoor air quality, the Chinese government needs to focus its attention on rural areas.<sup>13</sup>

Globally, approximately one third of the world's population still relies on solid fuels, including biomass fuels, for domestic energy needs.<sup>14</sup> More than 75 percent of the populations of India, China, and nearby countries continue to cook and heat with biomass fuels.<sup>15</sup> As a result, indoor air pollution accounts for more than 1.6 million annual deaths and 2.7 percent of the global burden of disease (in Disability-Adjusted Life Years).<sup>16</sup>

<sup>7</sup> World Health Organization, *Broader Impacts of Household Energy*, at <http://www.who.int/indoorair/impacts/en/> (last visited Feb. 10, 2005).

<sup>8</sup> *Id.*

<sup>9</sup> William P. Alford, Robert P. Weller, Leslyn Hall, Karen R. Polenske, Yuanyuan Shen, & David Zweig, *The Human Dimensions of Pollution Policy Implementation: Air Quality in Rural China*, 11(32) *J. OF CONTEMPORARY CHINA* 495, 500 n.21 (2002) (citing a 1992 study Jonathan E. Sinton, *China Energy Databook*, Berkeley: Lawrence Berkeley Laboratory pp. IV-63 (1990)).

<sup>10</sup> Gwynne Wiatrowski Guzzeeau, Note, *Indoor Air Pollution: Energy Problems in China's Residential Sector*, 11 *GEO. INT'L ENVTL. L. REV.* 439, 447 (1999).

<sup>11</sup> About one third of the urban population now has access to gas for cooking. Even the households who continue to use coal use cleaner briquettes. JOHNSON, *supra* note 2, at 10.

<sup>12</sup> Alford, *supra* note 9, at 500 n. 19.

<sup>13</sup> JOHNSON, *supra* note 1, at 2, 10.

<sup>14</sup> World Health Organization, *Indoor Air Pollution*, at <http://www.who.int/indoorair/en/> (last visited Feb. 10, 2005).

<sup>15</sup> World Health Organization, *Regional Burden of Disease Due to Indoor Air Pollution*, at [http://www.who.int/indoorair/health\\_impacts/burden\\_regional/en/](http://www.who.int/indoorair/health_impacts/burden_regional/en/) (last visited Feb. 10, 2005).

<sup>16</sup> World Health Organization, *Global Burden of Disease Due to Indoor Air Pollution*, at [http://www.who.int/indoorair/health\\_impacts/burden\\_global/en/](http://www.who.int/indoorair/health_impacts/burden_global/en/) (last visited Feb. 10, 2005).

In developing countries, women and children face the greatest exposure to the harmful health effects of pollution.<sup>17</sup> Women traditionally carry out most household chores and spend a considerable part of their time indoors.<sup>18</sup> Studies have shown an association between exposure to indoor air pollution and the incidence of respiratory disease in female non-smokers.<sup>19</sup> The pollution also affects young children under their mothers' care. Studies have shown a correlation between pollution and respiratory disease as a cause of death in young children under age five.<sup>20</sup> Globally, acute lower respiratory infections represent the single most significant cause of death in children under age five and account for at least 2 million deaths annually in this age group.<sup>21</sup>

Further, indoor air pollution contributes to the global problems of deforestation and the greenhouse effect.<sup>22</sup> Impoverished families often rely on wood as a fuel; this reliance will likely lead to increased deforestation in areas where the demand for wood outstrips natural re-growth.<sup>23</sup> Inefficient biomass stoves emit products of incomplete combustion, such as methane gas, which contribute to the greenhouse effect.<sup>24</sup>

The narrow issue of the health effects of indoor air pollution stands in the midst of issues of poverty, outdoor pollution, and environmental degradation. However, overcoming problems in the larger context will require other legislation to facilitate rural dwellers' efforts to use their resources to enhance their quality of life. This note focuses on and proposes ways to alter or eliminate use of biomass fuels in rural Chinese households and reduce harmful health effects of such pollution.

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Disability Adjusted Life Year (DALY) measures the state of health of a population and is the only quantitative indicator of burden of disease that reflects the total amount of healthy life lost, to all causes, whether from premature mortality or from some degree of disability during a period of time. See *The Disability-Adjusted Life Year (DALY) Definition, Measurement and Potential Use*, at [http://www.worldbank.org/html/extdr/hnp/hddflash/workp/wp\\_00068.html](http://www.worldbank.org/html/extdr/hnp/hddflash/workp/wp_00068.html).

<sup>17</sup> *Supra* note 7; see also *supra* note 1.

<sup>18</sup> *Id.*; see also *supra* note 12.

<sup>19</sup> "In developing countries, non smokers, frequently women, form a much larger proportion of patients with lung cancer. Thus, around two thirds of women with lung cancer are from China (Gao, 1996), Mexico (Medina et al., 1996) and India have been found to be non-smokers (Gupta RC et al., 1998)."

<sup>20</sup> World Health Organization, *Health Effects*, at [http://www.who.int/indoorair/health\\_impacts/disease/en/](http://www.who.int/indoorair/health_impacts/disease/en/) (last visited Feb. 10, 2005).

<sup>21</sup> *Id.*

<sup>22</sup> *Supra* note 7.

<sup>23</sup> *Supra* note 7.

<sup>24</sup> *Id.*

### C. *The Problem-Solving Methodology*

This note utilizes a problem-solving methodology to define and address the problem of indoor air pollution.<sup>25</sup> In order to formulate a target solution, the methodology first calls for a thorough description of the problem in question. Part II discusses the problem of indoor air pollution in China. Section A describes indoor air pollution and its health effects on household occupants. Section B identifies the actors and patterns of behavior that constitute the problem. The note identifies the behavior of the household and that of current relevant governmental agencies as contributors to the growing problem of indoor pollution.

To further focus the solution, Part III identifies the causes of the behavioral patterns that comprise the social problem. The behaviors of each actor identified in Part II will be examined based on the ROCCIPI approach.<sup>26</sup> The ROCCIPI approach encompasses the following categories of legislative theory: rule, opportunity, capacity, communication, interest, process, and ideology.<sup>27</sup> A discussion of the different categories will unveil interrelated explanatory hypotheses for the role occupants' problematic behaviors.<sup>28</sup>

Finally, Part IV demonstrates that establishing a new department to set standards for indoor emissions will likely alter or eliminate causes of problematic behaviors relating to indoor air pollution. The discussion includes the proposed department's monitoring process of implementation and dissemination of the indoor emissions policies. Also, the proposed department will provide feedback mechanisms to ensure flexibility and self-correction. In the end, a comparison of possible alternative solutions with the proposed solutions will further support the proposed legislation.

## II. A STATEMENT OF THE SOCIAL PROBLEM

Since law solves problems by changing behavior, Part II not only describes the effects of indoor air pollution, but also explores whose and what behavior constitutes the problem. The discussion focuses on households' persistent use of air-polluting biomass and the relevant implementing agencies' neglect of rural fuel problems. A description of problematic behaviors ensures that the proposed solution will effectively change those institutions.

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<sup>25</sup> See ANN SEIDMAN ET AL., *LEGISLATIVE DRAFTING FOR DEMOCRATIC SOCIAL CHANGE: A MANUAL FOR DRAFTERS* 88-92 (2001).

<sup>26</sup> See *id.* at 93-99.

<sup>27</sup> *Id.*

<sup>28</sup> *Id.* at 95.

### A. *The Social Problem*

Rural Chinese households often rely on the most convenient and affordable fuels for cooking and heating. As fuel for their stoves, they use biomass such as crop residues, dung, straw, wood, or coal.<sup>29</sup> Nationwide, biomass fuels account for 70 percent of the fuel used in rural households.<sup>30</sup> Indoors, fuels burn in open fires or inefficient stoves and emit high levels of harmful pollution.<sup>31</sup> These harmful pollutants consist of complex mixtures of chemicals, carbon monoxide, nitrous oxides, sulphur oxides, formaldehyde, and carcinogens.<sup>32</sup> These small particles have a diameter of ten microns or less and penetrate deep into the lungs, posing the greatest health-damaging potential.<sup>33</sup> Occupants live with and inhale the resulting pollution.

Studies show that exposure to indoor air pollution leads to acute lower respiratory infections, chronic bronchitis, chronic obstructive pulmonary disease, and lung cancer.<sup>34</sup> Together, the above respiratory diseases account for the leading cause of death in rural areas of China.<sup>35</sup>

In China, indoor levels of small particle matters far exceed both the Chinese and the World Health Organization (WHO) standards.<sup>36</sup> WHO's air quality standard for residential areas is a maximum small particle concentration of 70 micrograms per cubic meter.<sup>37</sup> China's small particle concentration is more than double the WHO standard, at 150 micrograms per cubic meter.<sup>38</sup> Within Chinese households, kitchens have the highest concentrations of small particle matters when compared to other areas of the house.<sup>39</sup> Nearly equivalent rates of respiratory disease among Chinese men and women, despite the fact that few women smoke, suggest that high concentrations of indoor air pollutants cause such disease in Chinese women.<sup>40</sup>

Cooking is the primary source of indoor air pollution.<sup>41</sup> A study conducted in Anqing city found that although some kitchens allow fumes to

<sup>29</sup> World Health Organization, *Health Impacts of Indoor Air Pollution*, at [http://www.who.int/indoorair/health\\_impacts/en/](http://www.who.int/indoorair/health_impacts/en/) (last visited Feb. 10, 2005).

<sup>30</sup> Alford, *supra* note 9, at 500 n. 23.

<sup>31</sup> *See generally supra* note 15.

<sup>32</sup> *Supra* note 2.

<sup>33</sup> *Supra* note 2.

<sup>34</sup> *Id.*

<sup>35</sup> JOHNSON, *supra* note 1, at 9.

<sup>36</sup> Guzzeau, *supra* note 10 at 344; *see also* JOHNSON, *supra* note 2, at 9-10.

<sup>37</sup> JOHNSON, *supra* note 1, at 10.

<sup>38</sup> *Id.*

<sup>39</sup> Guzzeau, *supra* note 10, at 446.

<sup>40</sup> *Id.* at 18.

<sup>41</sup> Alford, *supra* note 9, at 501. The article studied Anqing, a small city and its rural hinterland on the Yangzi River in southern Anhui province. The study of Anqing is "suggestive of the general situation over large areas of rural China that have similar education levels, health situations, and fuel use patterns." *Id.* at 498. *See also* Daniel

dissipate, people working directly at the stoves still experienced higher concentrations of pollutants.<sup>42</sup> Grandmothers and mothers of Anqing families spend the most time cooking.<sup>43</sup> In local community-based epidemiological surveys, women constituted 77 percent of the people who cook and generally were found to have greater exposure than their husbands and sons to the major sources of indoor pollution on a daily basis.<sup>44</sup> During these household chores, young children often accompany their mothers and spend many hours exposed to pollutants.<sup>45</sup>

Winter heating constitutes the other main domestic use for fuel.<sup>46</sup> Winter lasts for an average of 2.5 months each year, during which time household occupants experience higher levels of indoor pollution.<sup>47</sup> The more months a household uses heating in the winter, the more likely it is that its members will show impaired lung function.<sup>48</sup> To make the problem worse, women often have little or no decision-making power to better their situation.

### B. *Whose and What Behaviors Constitute the Problem*

The behaviors of role occupants<sup>49</sup> and implementing agencies contribute to the problem of indoor air pollution. Men and women of the household constitute the primary role occupants and directly cause and suffer from indoor air pollution. Household occupants make decisions as to the type of fuel to use and have the ability to distance themselves from the resulting pollution. Also, relevant Chinese governmental agencies contribute to the problem by failing to prioritize and monitor air pollution in rural areas. This section examines the behaviors of each group of actors.

#### 1. The Household

All members of the household suffer from the harmful health effects of indoor air pollution. However, on a daily basis, women generally face

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Kammen, Transcripts, *Sustainable Energy Development in Emerging Markets* 24 U. PA. J. INT'L ECON. L. 759, 768 (2003).

<sup>42</sup> Alford, *supra* note 9, at 501. The study examined "the ways in which [air pollution] policy measures have been communicated to, understood by, and acted upon by the citizenry, drawing in important part on household and epidemiological surveys conducted in Anhui." *Id.*

<sup>43</sup> *Id.*

<sup>44</sup> *Id.* Table 1.

<sup>45</sup> Guzzeau, *supra* note 10, at 447.

<sup>46</sup> Alford, *supra* note 9, at 501.

<sup>47</sup> *Id.*

<sup>48</sup> *Id.*

<sup>49</sup> "A law always addresses two sets of persons: the law's primary addresses whose behaviors the law-makers principally propose to change ("role occupants"), and those who work for the agency responsible for implementing the law ("implementing agencies")." *See Id.* at 16.

more exposure to indoor air pollution than their husbands and sons.<sup>50</sup> For instance, for families in Anqing, the mother does the cooking and the grandmother keeps the stove stocked with biomass fuels or coal.<sup>51</sup> Common to Chinese cooking, the women generally keep the stove at a high temperature in order to fry foods in hot oil.<sup>52</sup> These women spend most of their day breathing in high concentrations of pollutants. In addition, women may be responsible for collecting the biomass from nearby woods or farm lands.<sup>53</sup>

Compared to women, men spend less time cooking in the kitchen. Alford's study showed that in Anqing 5,049 out of 6,161 female subjects reported cooking frequently in the kitchen.<sup>54</sup> On the other hand, only 437 out of 5,680 male subjects responded that they often cook in the kitchen.<sup>55</sup> The study indicates that Chinese women spend more time preparing meals in the kitchen.

Although women are more exposed to indoor pollution, traditionally, women do not participate in financial resource allocation and have little to no control over the type of fuel used for cooking and heating.<sup>56</sup> Male heads of the family usually make decisions to allocate the family's financial resources, including fuel usage.<sup>57</sup>

## 2. Implementing Agencies

Three organs of the Chinese government contribute to the environmental policy decision-making system.<sup>58</sup> First, the Environment and Resources Protection Committee (ERPC) of the National People's Congress (NPC)<sup>59</sup> legislates on environmental policies. Second, the State

<sup>50</sup> See generally Guzzeau, *supra* note 10.

<sup>51</sup> *Supra* note 41.

<sup>52</sup> Keith Florig, *Indoor Air Pollution in Rural China – A Systems Perspective* 19 (May 3-4, 2000) (slides presented at the Global Consultation on the Health Impacts of Indoor Air Pollution & Household Energy in Developing Countries, available at [http://www.andrew.cmu.edu/user/kf0f/IAP\\_Systems\\_Perspective\\_slides\\_5-00.pdf](http://www.andrew.cmu.edu/user/kf0f/IAP_Systems_Perspective_slides_5-00.pdf)).

<sup>53</sup> *Supra* note 8. It is unclear whether in China women are the primary collectors for fuel. However, according to the WHO, in most developing countries, it is women who collect fuel and carry out household tasks. *Id.*

<sup>54</sup> Alford, *supra* note 9, at 502. Of the sample 4,837 women were non-smokers. *Id.*

<sup>55</sup> *Id.* Only 126 of the 437 males were non-smokers. *Id.*

<sup>56</sup> See generally Anna M. Han, *Holding-Up More Than Half the Sky: Marketization and the Status of Women in China*, 11 J. CONTEMP. LEGAL ISSUES 791 (2001).

<sup>57</sup> *Supra* note 7.

<sup>58</sup> Kebin He et al., *Urban Air Pollution in China: Current Status, Characteristics, and Progress*, 27 ANN. REV. ENERGY & ENV'T 397, 398-99 (2002).

<sup>59</sup> UNEP China Office, at <http://www.zhb.gov.cn/english/China-Office/institutions.htm> (last visited Feb. 17, 2005). The office writes: "The NPC is the highest organ of the state power. It exercises legislative power, power to make appointments and removals, and power of supervision. The NPC has the power to amend the Constitution, and to enact and amend basic laws governing the State organs and other



Environmental Protection Agency (SEPA) works under the State Council.<sup>60</sup> Lastly, ministries and related agencies at all levels of the government implement environmental policies in China.<sup>61</sup>

Established in 1994, the ERPC is a seventeen-member advisory board subordinate to the NPC.<sup>62</sup> The responsibilities of the ERPC include drafting, implementing, and monitoring environmental legislation.<sup>63</sup> However, the ERPC does not participate in environmental protection at the local level.

The State Council created SEPA at the ministerial-level in 1998.<sup>64</sup> At the national level, SEPA functions as the administrative body under the State Council responsible for environmental protection.<sup>65</sup> SEPA's major responsibilities include formulating general and specific policies and administrative regulations to disseminate the policies.<sup>66</sup> Locally, SEPA's duties consist of collecting environmental data from local Environmental Protection Bureaus (EPBs) at the province, municipality, and city levels.<sup>67</sup> Also, SEPA provides training and administrative support to the local bureaus.<sup>68</sup>

SEPA's powers extend to the organization and supervision of pollution prevention plans<sup>69</sup> in regions identified by the Central Government. The agency establishes information networks, gathers statistics on environ-

matters. Further, NPC has the power to examine and approve the plan for national economic and social development; examine and approve the State budget; and decide on the establishment of special administrative regions and the systems to be instituted within them. [. . .] The Council formulates administrative measures and regulations, promulgates decisions and orders, and exercises unified leadership over the work of other organizations under its jurisdiction."

<sup>60</sup> *Id.* "The State Council, the Central People's Government, is the highest state administrative body and answer and reports to the NPC. The State Council implements the laws enacted and decisions adopted by the NPC and its Standing Committee. The Council consists of the premier, vice-premiers, state councilors, the heads of the various ministries and commissions, the auditor-general and the secretary-general. Currently, Vic Premier, Mr. Zeng Peiyan, is responsible for environmental issues."

<sup>61</sup> JOHNSON, *supra* note 1, at 8.

<sup>62</sup> UNEP China Office, *supra* note 55.

<sup>63</sup> *Id.*

<sup>64</sup> Alford, *supra* note 9, at 496. SEPA's minister, Xie Zhenhua, does not have a permanent seat on the Council, but participates in meetings when they discuss environmental issues. UNEP China Office, *supra* note 60.

<sup>65</sup> UNEP China Office, *supra* note 59.

<sup>66</sup> *Id.*

<sup>67</sup> JOHNSON, *supra* note 1, at 8.

<sup>68</sup> *Id.*

<sup>69</sup> *Supra* note 9. The responsibilities of the SEPA include preventing the pollution of air, water, soil, noise, solid wastes, toxic chemicals and vehicle emission. Further, the SEPA is responsible for guiding, coordinating and supervising marine environmental protection.

mental quality, and identifies pollution sources.<sup>70</sup> Also, the agency conducts research and development of new environmental technology.<sup>71</sup> Further, SEPA publishes its research and organizes programs to promote consciousness about environmental issues.<sup>72</sup> As part of the promotion, SEPA organizes the participation of the public and related non-governmental organizations.

Lastly, several state commissions and ministries under the State Council contain departments that touch the area of regulation of environmental pollution. These commissions include the National Development and Reform Commission and the Ministries of Foreign Affairs, Finance, Land and Resources, and Science and Technology.<sup>73</sup> With regard to environmental policy, these ministries have a responsibility to coordinate with SEPA.<sup>74</sup>

### C. Conclusion

The problem of indoor air pollution poses serious health problems for the residents of rural China. Role occupants in the household continue to contribute to the problem by using biomass fuels to power their stoves. Currently, agencies focus their resources on lowering outdoor pollution in urban areas and have neglected rural areas.<sup>75</sup> Part III examines all the possible causes of the problematic behaviors. A detailed analysis of these causes lays the foundation for deciding the specific provisions of legislation that can effectively address those causes.

## III. EXPLANATIONS OF THE BEHAVIORS THAT COMPRISE THE PROBLEM

Each set of role occupants, including implementing agency officials, behave as they do in the face of existing law. Their behaviors may be based on a range of interacting objective and subjective factors.<sup>76</sup> The proposed solution must effectively alter or eliminate these factors if it aims to induce the relevant actors to behave in ways more likely to reduce rural air pollution. In order to address the social harm, one must

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<sup>70</sup> *Id.*

<sup>71</sup> *Id.*

<sup>72</sup> *Id.*

<sup>73</sup> *Id.*

<sup>74</sup> *See generally id.*

<sup>75</sup> Rural household energy use accounted for 24 percent of all energy consumption in China. Alford, *supra* note 11, at 500 n.21 (citing a 1992 study Jonathan E. Sinton, *China Energy Databook*, Berkeley: Lawrence Berkeley Laboratory pp. IV-63 (1990)).

<sup>76</sup> Subjective factors consist of the role occupants' interests and ideologies or values and attitudes. SEIDMAN, *supra* note 25, at 95. On the other hand, Objective factors include rule, opportunity, capacity, communication, and process; and "center attention on the institutional causes of the behaviors that block good governance and developments." *Id.* at 96.

explore the causes of the behaviors contributing to the problem. This section will analyze the behaviors of role occupants and the governmental agencies utilizing the ROCCIPI categories.<sup>77</sup> First, “existing laws” provide insight as to the reasons behind problematic behaviors.<sup>78</sup> Second, “interest and ideology” are great barriers regarding the law’s ability to change behaviors.<sup>79</sup> Third, “capacity” addresses the influences of internal resources and what the actor could do to solve the problem.<sup>80</sup> Fourth, “opportunity” speaks to external resources that limit the actor’s current behaviors and the possibility of changing that behavior in the future.<sup>81</sup> “‘Communication’ tracks a society’s social structure” and the government’s channels of dispensing knowledge to its people.<sup>82</sup> Lastly, “process” explores the criteria and procedures followed by the governmental agency in implementing laws.<sup>83</sup>

### A. *A Description of the Laws Governing Air Pollution*

To understand the existing behaviors of the actors, relevant laws governing the problem need to be examined. In China, the Law of the People’s Republic of China on the Prevention and Control of Atmospheric Pollution (LCPCAP) governs the issue of air pollution.<sup>84</sup>

As stated in its general provisions, the LCPCAP sets a goal of reducing the amount of air pollution and protecting the atmospheric environment.<sup>85</sup> The law empowers the State Council to appoint departments to establish the national standards for atmospheric quality.<sup>86</sup> However, no provisions exist to guide the State Council as to the type or number of

<sup>77</sup> *Id.* at 93-99.

<sup>78</sup> *Id.* at 96.

<sup>79</sup> *Id.* at 95-96.

<sup>80</sup> *Id.* at 98.

<sup>81</sup> *Id.* at 97.

<sup>82</sup> *Id.* at 98.

<sup>83</sup> *Id.*

<sup>84</sup> State Environmental Protection Administration, Law of the People’s Republic of China on the Prevention and Control of Atmospheric Pollution, at <http://www.zhb.gov.cn/english/chanel-3/detail-3.php3?chanel=3&column=1&id=6> (last visited Feb. 17, 2005). The Chinese government adopted LCPCAP in 1995 and amended it in 2000.

<sup>85</sup> *Id.* Ch. 1, Art 3: “The State takes measures to control or gradually reduce, in a planned way, the total amount of the main atmospheric pollutants discharged in local areas. [. . .] The local people’s governments at various levels shall be responsible for the quality of the atmospheric environment under their own jurisdictions, making plans and taking measures to make the quality of the atmospheric environment under their own jurisdictions meet the prescribed standard.”

<sup>86</sup> *Id.* Ch. 1, Art. 6: “The administrative department of environmental protection under the State Council shall establish national standards for atmospheric environment quality. [. . .] The people’s governments of provinces, autonomous regions and municipalities directly under the Central Government may establish their local standards for items not specified in the national standards for atmospheric

agencies or departments needed. It appears that the State Council retains full discretion concerning the administrative standards of the agencies and departments that are needed.

Further, Article 6 of the LCPCAP states that local governments can establish more specific environmental standards whenever national standards do not address a particular issue.<sup>87</sup> Article 6 grants powers to various local jurisdictions, but does not provide methods of reporting to the central agency to ensure uniformity. Article 22 reflects the degree of discretion left to the administrative agency. It allows the agency to set up a monitoring system for pollution and work out unified monitoring measures.<sup>88</sup> Lastly, part of the incentive structure built into this law encourages the reporting of violators and rewards outstanding achievements in the prevention of air pollution.<sup>89</sup>

LCPCAP governs the broad issue of air pollution and may affect the behaviors of private households and implementing agencies.

## B. Household

Ignorance and lack of resources may explain households' usage of biomass fuels. An examination of the ROCCIPI categories will reveal that the existing air pollution rules do not directly address the individuals within a household. Also, even if the rules are amended to address the household, there may be a lack of communication of the rules to the household.

### 1. Rule

LCPCAP does not directly address the problem of indoor air pollution. Some households may understand the general spirit of the law and act accordingly, but LCPCAP may nonetheless have little to no effect on overall household behavior regarding indoor pollution.

Not only does LCPCAP neglect the problem of indoor air pollution, the law does not prescribe what action, if any, households and private individuals should take to reduce exposure to pollution. LCPCAP's gen-

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environment quality and report the same to the administrative department of environmental protection under the State Council for the record."

<sup>87</sup> *Id.* .

<sup>88</sup> *Id.* Art. 22: "The administrative department of environmental protection under the State Council shall set up a monitoring system for atmospheric pollution, organize a monitoring network and work out unified monitoring measures."

<sup>89</sup> *Id.* Art. 5: "All units and individuals shall have the obligation to protect the atmospheric environment and shall have the right to report on or file charges against units or individuals that cause pollution to the atmospheric environment."

Art. 8: "The people's governments at various levels shall reward units or individuals that have made outstanding achievements in the prevention and control of atmospheric pollution or in the protection and improvement of the atmospheric environment."

eral language grants power to the State Council in setting up administrative agencies. The provisions do not mention the problem of indoor air pollution, but refer to atmospheric pollution in general.

Article 5 stands as the only provision that describes the duties of individuals and households. It states in very broad language that all individuals have the duty to protect the atmosphere and report or file charges against polluters.<sup>90</sup> However, the law itself does not educate individuals about or point to the problem of indoor air pollution. LCPCAP's ambiguous terms hinder any attempt to solve local pollution problems.<sup>91</sup> The law fails to address the permissible nature and procedure of the complaints. Nor does it specify the agencies that individuals could approach. Also, the law fails to provide rural families any assistance in finding and using alternative fuels.

With the increased difficulty of disseminating information in rural areas, the problem of illiteracy, and continued aversion to legal formality, household behaviors may not be directly affected by the existing laws.<sup>92</sup>

## 2. Interest/Ideology

In the household, women carry out most of the activities giving rise to indoor air pollution. Unfortunately, prejudice against women in Chinese society limits their ability to change their behaviors.

Traditionally, Chinese society considered women inferior to men. This ideology can be traced as far back as Confucius. The Confucian doctrine mandated that daughters obey their fathers until married, defer to their husbands during marriage, and yield to their sons if widowed.<sup>93</sup> Despite the Communists' attempt to impose gender equality by granting women legal rights, Confucian thought still dominates the social behavior of the Chinese.<sup>94</sup> To this day, Chinese women hold a lower status within the family.<sup>95</sup> The family sees education for daughters as a waste since it does not teach the primary responsibilities of Chinese women as housekeepers.<sup>96</sup> As a result of this ingrained ideology, women's issues remain a low priority for the family and the government.<sup>97</sup>

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<sup>90</sup> See *supra* note 89.

<sup>91</sup> Assuming that rural households will even have access to the laws in the first place.

<sup>92</sup> In practice, none of the new policies have much effect on environmental practice among Anqing villagers. Only a handful of the villagers are familiar with the relevant laws. Few people report having ever taken environmental actions beyond compulsory tree planting or street cleaning. Alford, *supra* note 9, at 500.

<sup>93</sup> This is a concept known as the "Three Followings." Han, *supra* note 56, at 795.

<sup>94</sup> Janice A. Lee, Note, *Family Law of the Two Chinas: A Comparative Look at the Rights of Married Women in the People's Republic of China and the Republic of China*, 5 *Cardozo J. Int'l & Comp. L.* 217, 235, 246. (1997).

<sup>95</sup> *Id.* at 240.

<sup>96</sup> Han, *supra* note 56, at 795.

<sup>97</sup> Lee, *supra* note 94 at 221 n.24.

A potential conflict of interest exists between the women and men of the household. Prolonged exposure of women to pollution and the corresponding respiratory problems may ultimately alert women to the effects of indoor air pollution.<sup>98</sup> However, the question remains unanswered as to whether men would spend more resources in obtaining cleaner fuels for women's use.

### 3. Capacity

Most of the households do not possess knowledge of the harmful effects of indoor air pollution.<sup>99</sup> One possible explanation is that the government has not prioritized and disseminated this information to rural communities. Another explanation suggests that people may lack the capacity to receive and understand the information.

Studies have shown a correlation between the level of education and recognition of environmental problems.<sup>100</sup> In Anqing, less than half the people achieved an education level beyond elementary school and 39 percent had no education.<sup>101</sup> Forty-eight percent of women never attended school.<sup>102</sup> Inadequate education leads to illiteracy and prevents the household from obtaining information transmitted through fliers or newspapers.<sup>103</sup> Further, without education, people may not appreciate and understand the scientific concept of pollution.

Women's lack of capacity to understand the idea and consequences of pollution is more severe than that of men. Females account for approximately 70 percent of China's illiterate and semi-literate population.<sup>104</sup> In rural areas, the rate of illiteracy in 1982 among girls aged fifteen exceeds

<sup>98</sup> Through interviews, Alford's Anqing study showed that women, more than men, attribute respiratory problems on the environment. This is because many respiratory problems in men stem from smoking which very few women in rural Anqing do. Alford, *supra* note 9, at 503.

<sup>99</sup> *Id.* at 497; *see generally id.* at 508 (stating that most households do not possess knowledge of governmental Air Pollution Laws).

<sup>100</sup> *Id.* at 505, *see n.*34, 35.

<sup>101</sup> *Id.*

<sup>102</sup> *Id.*

<sup>103</sup> Susmita Dasgupta and David Wheeler of the World Bank conducted a model that shows that, holding all else constant, a 1 percent increase in literacy rate seems to induce a 2 percent increase in environmental complaints. Susmita Dasgupta & David Wheeler, *Citizen Complaints as Environmental Indicators: Evidence from China 11* (1997) (Policy Research Working Paper 1704, World Bank).

In rural areas, television is the most important source of information. This is consistent with the fact that TVs are the most common household appliance, outnumbering radios, fans, or even bicycles. Alford, *supra* note 11, at 504.

<sup>104</sup> Han, *supra* note 56, at 802 (*citing* Zhonggou Funu Tongji Ziliao, *Statistics on Chinese Women (1949-1989)*, Research Institute of the All China Women's Federation, 63 (1991)).

the male rate by ten times.<sup>105</sup> Thus, women stand at a greater disadvantage regarding their ability to acquire information regarding the environment or even information about alternative fuels.<sup>106</sup>

#### 4. Opportunity

Most rural households may not realize or may refuse to believe the harmful effects of indoor air pollution. Those households would then not have the opportunity to protect themselves from the pollution. However, even if rural households realize the problem, they may not have the economic ability or political power to change their behavior.<sup>107</sup>

To begin with, a lack of resources and money severely limits the rural household's opportunity to seek alternative stoves or fuels. Currently, households collect biomass fuels from field, farms, and forests.<sup>108</sup> Alternative sources of clean fuel such as gas or electricity, on the other hand, cost money. Since rural households often have little or no monetary resources, the households can only turn to the government for assistance.

Village committee meetings provide households an opportunity to voice their concerns and needs. However, as shown in Anqing, village meetings face low levels of participation.<sup>109</sup> Only 25 out of the sample of 244 interviewees had ever attended a meeting and only five had spoken at the meeting.<sup>110</sup>

Again, women experience a greater disadvantage when it comes to their opportunity to prevent air pollution. Due to their inferior status in the family, they often will not have decision making power with regard to financial resources. As for village meetings, female participation rates lag behind the already minimal male rates.<sup>111</sup>

#### 5. Communication

Households may have no way of realizing the health effects of activities that lead to indoor pollution, but for some type of communication. In China, campaigns serve as an important mechanism to raise awareness of environmental problems.<sup>112</sup> The government spreads information through the broadcast media, loudspeaker systems, slogans painted on

<sup>105</sup> Further, the rate of female illiteracy between 1982 and 1990 rose from 69.2 percent to 73.49 percent. *Id.* at n.58.

<sup>106</sup> One can assume that if women realize the harmful health effects of cooking they would take steps to better ventilate the kitchen and protect themselves.

<sup>107</sup> In Anqing, although people suspected local environmental problems, most did not know what to do or felt any action would be useless. Alford, *supra* note 9, at 506-7.

<sup>108</sup> *Supra* note 7.

<sup>109</sup> *Id.* at 511.

<sup>110</sup> *Id.*

<sup>111</sup> *Id.* at 510.

<sup>112</sup> *Id.* at 504.

walls, and fliers.<sup>113</sup> However, the government's efforts have not reached rural populations. For instance, Alford's study in Anqing city showed that only 12 percent of the people knew of any environmental campaign.<sup>114</sup>

As noted in the above section, households could communicate their concerns to the government at committee meetings and vice versa. However, people seldom believe that the meetings will actually affect environmental problems.<sup>115</sup> At these meetings, the environment stands at the bottom of the list of priorities.<sup>116</sup> In addition, rural Chinese show little tolerance for dissenting views.<sup>117</sup> Speaking up about indoor air pollution could bring dangerous community disapproval on the household.

Communication exists between the men and women of the household. However, presently, little information addresses whether women could freely express their health concerns to their husbands or sons. Even if the women expressed their concerns, more sociological research would need to be done to determine whether the men will give proper weight and respond to the women's complaints.

### C. *Implementing Agency (SEPA)*

Most of the available research concerning the relevant governmental agencies concerns the jurisdiction and existing powers of the agencies. Much of the information regarding the agencies' actual performance remains unavailable to the public. However, the SEPA and its local EPBs provide a direct impact on the households. Thus, this note looks to the impact that the SEPA has on individuals and households to derive, in practice, the functions and behaviors of the SEPA.

#### 1. Rule

Environmental laws in China have involved building better political institutional capacity to identify and manage environmental problems.<sup>118</sup> However, the laws contain ambiguous language and grant overly broad discretion to officials to pursue any environmental issues.

On the issue of air pollution, Article 6 of LCPCAP<sup>119</sup> requires the environmental agency under the State Council, SEPA, to establish national standards for atmospheric quality. Due to the ambiguous language of LCPCAP, the rule fails to specify the criteria or procedure by which to

<sup>113</sup> *Id.*

<sup>114</sup> *Id.*

<sup>115</sup> *Id.* at 511.

<sup>116</sup> *Id.*

<sup>117</sup> Andrew J. Nathan & Tianan Shi, *Cultural Requisites for Democracy in China*, 122 *DAEDALUS* 95, 95-123 (1993).

<sup>118</sup> Alford, *supra* note 9, at 500.

<sup>119</sup> SEPA, *supra* note 84.



establish those standards.<sup>120</sup> Further, LCPCAP does not prescribe any manner of reporting and does not contain any provisions for the State Council to check SEPA's standards.<sup>121</sup> Perhaps the State Council reserves much of the discretion regarding such administrative rules, since LCPCAP specifies that SEPA functions under the State Council.<sup>122</sup> More likely, LCPCAP leaves SEPA the discretion to regulate prioritization, implementation, and monitoring measures.

Unchecked discretion can lead to corruption<sup>123</sup> and arbitrary or unfair implementation of the law. LCPCAP gives SEPA the discretion to prioritize their projects. Currently, SEPA focuses its resources on the improvement of outdoor air pollution in urban areas. Given limited resources, SEPA cannot tend to all of the current air quality issues. However, currently, SEPA's neglect of the rural areas reflects the government's low prioritization of poor and uneducated areas. Without more detailed legislation specifying the problem of indoor air pollution and its pervading health effects in the countryside, the plight of rural areas may remain invisible to SEPA.

## 2. Capacity/Opportunity

More information needs to be provided by the Chinese government about the governmental budget appropriated to SEPA in order to examine SEPA's capacity to carry out its functions, including training and educating its officials. Structurally, SEPA consists of several departments that carry out its major responsibilities. In addition, SEPA has the opportunity to disseminate information through a more decentralized approach with EPBs in local regions.

Currently, SEPA contains eleven separate departments.<sup>124</sup> Of interest to the topic of capacity and opportunity are the Department of Science, Technology, and Standards; the Department of Environmental Impact Assessment; and the Bureau of Environmental Supervision. The Science and Technology department researches and develops new technology. The Science and Technology department could research alternative fuels or stoves that the household could use.<sup>125</sup> Further, the departments of

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<sup>120</sup> See generally *id.*

<sup>121</sup> *Id.*

<sup>122</sup> *Id.*

<sup>123</sup> This note makes no claim of any current corruption practices in the Chinese environmental agency. It simply states that broad and ambiguous laws allow corruption to take place.

<sup>124</sup> State Environmental Protection Administration, at <http://www.zhb.gov.cn/english/chanel-4/chanel-4-end-1.php3?chanel=4&column=11> (last visited Feb. 17, 2005).

<sup>125</sup> State Environmental Protection Administration, at <http://www.zhb.gov.cn/english/chanel-4/detail-4.php3?chanel=4&column=11&id=7> (Feb. 17, 2005).

environmental supervision and assessment should allow SEPA to determine the allowable level of indoor air pollution and monitor its usage.<sup>126</sup>

Why does SEPA remain inactive regarding rural indoor air pollution? Perhaps SEPA does not possess enough resources to carry out its responsibilities. After all, not all of the local counties have established EPBs.<sup>127</sup> Even where EPBs exist, they have limited resources and do not really reach into the villages.<sup>128</sup> Or perhaps SEPA does not prioritize environmental issues in rural areas. In Anqing, residents did not feel that environmental protection received any priority by village committees.<sup>129</sup> The residents perceived that committee attention to specific issues depended on the amount of pressure exerted by higher-level authorities.<sup>130</sup> More information could aid a precise conclusion as to the cause of SEPA's inaction towards rural areas. For the purposes of this note, both causes remain probable.

### 3. Communication

SEPA's Administrative Office handles education and communication for the agency on two levels. First, the office provides a channel of communication to other relevant ministries and agencies.<sup>131</sup> Second, the office releases information to the public, organizes environmental education, and promotes participation.<sup>132</sup>

Communication provides uniformity among the different agencies and ministries. Communication between the agencies may have caused the different agencies to focus on pollution issues in urban areas. The uniformity thereby explains the government's total inaction with regard to the problem of pollution in rural area.

As to SEPA's communication with the public, campaigns and national bulletins release standards of local environmental protection to the public.<sup>133</sup> Also, the Administrative Office contains the Division of Public Complaints Settlement. The division allows the public to voice their concerns directly to the Agency. However, the fact remains that few rural

<sup>126</sup> *Id.* .

<sup>127</sup> Alford, *supra* note 9, at 500.

<sup>128</sup> *Id.*

<sup>129</sup> Only 6 percent of the sampled residents said that environmental problems are important to the committee. Most of the residents listed family planning, education, medical services, and taxes as issues important to the committees. Alford, *supra* note 9, at 513.

<sup>130</sup> *Id.*

<sup>131</sup> State Environmental Protection Administration, at <http://www.zhb.gov.cn/english/chanel-4/detail-4.php3?chanel=4&column=11&id=11> (last visited Feb. 17, 2005).

<sup>132</sup> *Supra* note 1.

<sup>133</sup> State Environmental Protection Administration, at <http://www.zhb.gov.cn/english/chanel-4/detail-4.php3?chanel=4&column=11&id=12> (last visited Feb. 17, 2005).

residents have ever heard of any environmental campaigns.<sup>134</sup> Even fewer people have made any complaints to the government regarding issues of pollution.<sup>135</sup>

#### 4. Process

Information regarding the exact process by which state agencies enforce and monitor environmental regulations remains unavailable to the public. The agencies' protocol only states that the NPC or State Council adopts environmental legislations and SEPA implements and monitors the legislation. As to the feedback mechanism, at the very least EPBs submit inputs from the local level back to SEPA. Also, local committees provide a forum for rural residents to provide feedback. Whether these committees actually report to EPBs or SEPA remains uncertain.

#### D. Conclusion

Explanations of the problematic behaviors can help identify specific and successful measures to overcome those behaviors. In the household, lack of resources and knowledge bars men and women from seeking alternative fuels. At the same time, SEPA neglects the problem of indoor air pollution in rural areas. These repetitive behaviors each contribute to the problem. Part IV of this note proposes ways to alter or eliminate the causes, and limit the harmful effects, of indoor air pollution.

### IV. SOLUTIONS

This note proposes an intransitive law<sup>136</sup> to establish a new department within the existing SEPA. In a country as large and rapidly changing as China, it is impossible to work out detailed provisions for all the different regions. The granting of law-making powers to a new department allows the department to conduct the necessary research and draft regulations to help change the problematic behaviors.

#### A. Alternative Potential Solutions

Several alternative solutions exist. The government could ban the use of biomass in rural areas or offer subsidies to households for the purchase of cleaner fuels or stoves. SEPA could also form a new department to

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<sup>134</sup> Alford's study discovered that only 12 percent of the people in Anqing had ever heard of any environmental campaigns. Alford, *supra* note 9, at 504.

<sup>135</sup> *Id.* at 508.

<sup>136</sup> An intransitive law "endows an agency with the power and responsibility to gather evidence as to problematic behaviors' causes and to formulate detailed rules to induce the new behaviors desired. In effect, they grant agency officials limited discretion to decide about initial measures to take, and to introduce new measures as they gain experience." See SEIDMAN, *supra* note 25, at 157.

oversee indoor air pollution in rural areas, but still utilize the present departments within SEPA to gather information and draft regulation.

The first option may be overly burdensome on rural residents because they could not afford to pay possible fines or purchase cleaner fuels. Similarly, a complete governmental subsidy of the cleaner fuels for the residents would prove prohibitively costly for the government. The third option remains the more likely alternative. However, without specialized divisions under the new department, the necessary research and implementation may not be done. Without specialized divisions, the new department will have to depend on existing departments that have other priorities. This dependence will likely hinder the process.

### *B. The Bill's Major Provisions*

The proposed department will address only the problems arising from indoor air pollution in rural areas. With the assistance of other relevant departments within SEPA, the new department will contain its own divisions to carry out its functions. For instance, the new department will contain its own science and technology division to research and develop cleaner and more efficient ways to cook. Having its own divisions will give the new department control over the allocation of its resources. Control of the resources will allow the department to specifically address the needs of the separate divisions, thereby making the department more efficient.

Each of the officials working for the new department must meet qualification standards and have a basic understanding of the specific needs of rural communities with regard to environmental issues. Also, these officials must remain full-time employees and undergo continuous training and workshops. Lastly, members may be removed for failure to perform duties ethically. The success of the department will ultimately depend on the individual employees. Therefore, strengthening the knowledge and loyalty of the department's employees will, in turn, strengthen the department.

With approval and review by SEPA, the new department will contain a division dedicated to adopting target regulations. Each submission of new regulations must be accompanied by relevant reports justified by scientific studies. Such reports should be published and made available to the public for review and critique. Transparency of the justifications for new regulations will not only allow for feedback, but will also make the department accountable for its decisions.

The regulations shall be based on principles of reward and incentives for rural households to adopt alternative fuels. Individuals generally act to gain benefits; hence, the incentive system will encourage individuals to learn its local environmental laws. Also, regulations issued by this agency must meet a minimum standard of clarity for rural residents to understand. The requirement of clarity will force drafters to keep the average lay person in mind when formulating laws. The above recommendations

will cure problems with communication of laws to the households and the ability of the people in the households to understand such laws.

To further address the issue of communication, Local Environmental Protection Bureaus must send a representative to attend village meetings. At the meetings, the representative should announce any new standards and record residents' concerns. Then, each EPB should compile the data collected from the meetings and submit it to the new department. The data will provide a channel of knowledge between the new department and the people in rural areas.

### C. *How the Preferred Solution Addresses the Problem*

With its own divisions to carry out the various responsibilities, the new department will have the capacity to research new and alternative fuels and to implement its policies. At the same time, empowering the new department to adopt and enforce regulations ensures that no external environmental entities maintain substantial influence upon its decision process. Further, the department's focus on rural areas would better address the specific needs of local residents.

Requiring EPBs to participate in local committee meetings ensures that the issue of indoor air pollution will be prioritized on the agenda. These meetings also provide a good channel for the EPB to conduct surveys and address any local concerns. Compiling the data from these meetings and submitting them to SEPA will further aid in crafting better legislation.

Regulation clarity requirements ensure that the new department will adopt rules different from current regulations. Due to the low level of education in rural areas, clarity ensures that the residents will understand the regulations. Also, clarity allows the residents to hold the new department accountable. The requirement for scientific reports will justify the need for and effectiveness of any new regulations and serve to convince rational skeptics. As an extra precaution, any new regulations would require the review and approval of the State Council and NCP.

Finally, providing full-time employment and continuous training may reduce the likelihood of officials taking bribes or leaving the agency for better experience.

### D. *Cost-Benefit Analysis*

Valuation of the physical damage caused by indoor air pollution and, thus, the avoidance of such costs, can serve as a useful guide as to the possible benefits of the proposed bill. Currently, measures of willingness to pay to avoid a premature death serve as the standard methodology for valuating environmental harm.<sup>137</sup> Based on that approach, the World

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<sup>137</sup> JOHNSON, *supra* note 1, at 23. The economic valuation of a human life poses difficulty because it raises social, political, and ethical questions.

Bank has estimated that indoor air pollution costs China about \$10.6 billion U.S. per year.<sup>138</sup>

The estimated benefit of cost avoidance greatly outweighs the costs of the proposed solution. Placing the new department in the existing SEPA proves cost effective. The new department could utilize the infrastructure and human resources already in place. The exact costs of establishing a new department will be hard to calculate, but the benefits of saving and improving lives most definitely outweigh any such monetary cost.

#### E. *Monitoring Performance*

The proposed solution requires that local EPBs specifically monitor the level of indoor air pollution in their relevant jurisdiction by attending village committee meetings and/or personally visiting households. Then, EPBs will report back to the new department within SEPA. This allows the department, by both enacting and enforcing regulations, to monitor its progress. Further, the process allows the department to adjust to any new technologies or problems as they arise. Finally, the State Council and NPC will monitor the adoption of new regulations.

### V. CONCLUSION

This note criticizes the current Chinese environmental framework because of its neglect of indoor air pollution in rural areas. The note aims to focus more governmental attention to the problem. After identifying the harmful health effects of indoor pollution and the behaviors that contribute to the problem, the new department will offer a more targeted solution to alter or eliminate indoor air pollution. Much work and research remains for the new department in eliminating the harms of pollution. However, with detailed and comprehensible regulations and a transparent process, the proposed new department provides a promising solution.

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<sup>138</sup> *Id.* at 23, 25. The cost includes the costs of indoor air pollution in urban areas. A mid-range estimate of the willingness to pay to avoid a premature death in the U.S. stands at \$3 million per statistical life. The estimate was conservatively scaled for use in China by multiplying by the ratio of (\$500/\$25,000), which results in an estimate of \$31,800 per statistical life in rural areas. *Id.* at 23, 25.