

# Washington Journal of Environmental Law & Policy

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Volume 11 | Issue 1

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9-15-2020

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### Recommended Citation

Yuichiro Tsuji Prof., *Climate Change Action and Adaptation in Tokyo*, 11 WASH. J. ENVTL. L. & POL'Y 89 (2020).

Available at: <https://digitalcommons.law.uw.edu/wjelp/vol11/iss1/4>

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# WASHINGTON JOURNAL OF ENVIRONMENTAL LAW AND POLICY

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SEPTEMBER 2020

Volume 11, Issue 1

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## CLIMATE CHANGE ACTION AND ADAPTATION IN TOKYO

Yuichiro Tsuji<sup>\*+</sup>

11 WASH. J. ENV'T. L. & POL'Y 89 (2020)

### ABSTRACT

This paper reviews an adaptation plan for the Tokyo Metropolitan Area. The Japanese Government decided to remain in the Paris Agreement and began trying to reduce CO<sub>2</sub> with technology after the Great East Japan Earthquake of 2011. Nuclear power plants were closed, and some are still under safety review. Newly built thermal power plants will increase CO<sub>2</sub> emissions, and the battle among the ministries hinders effective adaptation planning.

In 2012, the central government announced three basic approaches: risk management, comprehensive and general planning, and cooperating with local governments. However, the central government's tactics still fall behind other countries', and local governments such as prefectures

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+ The Washington Journal of Environmental Law and Policy is excited to publish its first piece in partnership with a foreign language author. We thank Professor David Litt of Keio University Law School for assisting with assertion checking in Japanese. Our journal's priority is to ensure all sources cited in the journal are available to all readers. Therefore, in publishing this article we chose to forgo strict adherence to Bluebook guidelines in order to make explicitly clear to our readers where to locate translated versions of articles.

and municipalities continue to need to mitigate the harmful effects of climate change. Local governments lack the appropriate information, technology, and budget. In 2018, the Ministry of the Environment released guidelines for local governments to draft adaptation plans. Tokyo established a basic environmental plan in 2008 and made an environmental prediction in 2009. By analyzing comparative administrative law and environmental law perspectives, this paper will review improvements to Japan's capacity to adapt and the sensibility of the Tokyo Metropolitan Adaptation Plan. Tokyo has several basic policies: establish a smart energy city, encourage the "3Rs" (recycle, reduce, and reuse), and sustainably use resources. The plan might present a good example for other prefectures, just as the State of California has become a model for other parts of the United States.

## I. CLIMATE CHANGE ACTIONS OF THE CENTRAL GOVERNMENT

Before analyzing the adaptation plan for the Tokyo Metropolitan Area, we will review several of the central government's actions. As in other countries, the Japanese central government takes a role in establishing comprehensive plans and policies, and local governments supplement, adjust, and implement them to match their unique needs and characteristics.<sup>1</sup> The constitution of Japan provides one chapter<sup>2</sup> for local governments, and local residents directly elect the governors of local governments such as prefectures, cities, and towns.<sup>3</sup> Although the central government uses a parliamentary system,<sup>4</sup> the parliament and governor of local governments are directly selected by the voters.<sup>5</sup>

Regardless of political distinctions between the central and local governments, climate change impacts all of Japan. The Ministry of Agriculture, Forestry and Fisheries pointed out that climate change affects farm products, causes intense rain, increases the size of typhoons, and increases the number of heat strokes.<sup>6</sup> Local governments need to have basic plans in place to match their unique geographic characteristics.

### A. *Adaptation in Japan: The Uniqueness of Japan*

The Japanese government signed the Paris Agreement in December 2015.<sup>7</sup> The Paris Agreement requires all signatory nations to follow climate change measures to maintain temperature increases at less than 1.5 or 2.0 degrees if possible.<sup>8</sup> The Paris agreement aims to reduce Greenhouse Gas (“GHG”) emissions to zero by the latter half of the century.<sup>9</sup> Participating countries established a reduction goal and now

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<sup>1</sup> KANKYO KIHON Hō [Basic Environment Act], Law no. 91 of 1993, art. 6, 7 (Japan). Translation is available at: <http://www.env.go.jp/en/laws/policy/basic/index.html>.

<sup>2</sup> NIHON KOKU KENPŌ [KENPŌ] [Constitution], chap.8 (Japan). Translation is available at: <http://www.japaneselawtranslation.go.jp/law/detail/?id=174&vm=04&re=01&new=1>.

<sup>3</sup> *Id.* at Art.93.

<sup>4</sup> *Id.* at Art.66(3).

<sup>5</sup> CHIHŌ JICHI HŌ [Local Autonomy Act], Act No. 67 of 1947 (Japan).

<sup>6</sup> Ministry of Agriculture, Forestry and Fisheries, Summary of the Basic Plan for Food, Agriculture and Rural Areas (April, 2015). Available at: [https://www.maff.go.jp/e/pdf/basic\\_plan\\_2015.pdf](https://www.maff.go.jp/e/pdf/basic_plan_2015.pdf).

<sup>7</sup> UNITED NATIONS CLIMATE CHANGE PROGRAM, *Paris Agreement – Status of Ratification*, <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>.

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

<sup>9</sup> *Id.* See also UNITED NATIONS CLIMATE CHANGE PROGRAM, *What is the Paris Agreement?* <https://unfccc.int/process-and-meetings/the-paris-agreement/what-is-the-paris-agreement>.

review and report it to the United Nations every five years.<sup>10</sup> The agreement also encourages participating countries to make their own adaptation plans to reduce climate change damages.<sup>11</sup>

Though a historic leader in the fight against climate change, the March 2011 earthquake caused Japan to rely more heavily on fossil fuels as every nuclear power plant stopped running.<sup>12</sup> Since 2011 the government has decided to reactive some nuclear power plants after establishing stricter safety regulations.<sup>13</sup>

In 2009, Prime Minister Yukio Hatoyama stated at the United Nations that Japan would reduce emissions to 25 percent below its 1990 levels by 2020.<sup>14</sup> Then in September 2012, the government declared zero nuclear power plants by 2030.<sup>15</sup> However, the Japanese government was not able to produce consistent, unified cabinet decisions. In December, the Liberal Democratic Party recaptured the government.<sup>16</sup> The Advisory Committee for Natural Resources and Energy, under the Ministry of Economy, Trade, and Industry (METI), regularly drafts the government's energy policy every three years.<sup>17</sup> After the third energy basic plan, the government made a cabinet decision in 2014 that nuclear power was necessary to meet the nations' electricity needs.<sup>18</sup>

When the administration changed, the central government returned to reactivating nuclear power, postponing a response to climate change.<sup>19</sup> The thermal power stations would continue running while the nuclear

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<sup>10</sup> *Id.*

<sup>11</sup> *Id.*

<sup>12</sup> Yuichiro Tsuji, *Thermal power stations in Japan after the Fukushima disaster* (forthcoming, Taiwan).

<sup>13</sup> Reiji Yoshida, *Cabinet OKs new energy policy, kills no-nuclear goal*, JAPAN TIMES (Apr. 11, 2014), <https://www.japantimes.co.jp/news/2014/04/11/national/cabinet-oks-new-energy-policy-kills-no-nuclear-goal/>.

<sup>14</sup> Chisa Fujioka, *Japan PM-elect backs 25 percent greenhouse gas cut*, REUTERS (Sept. 6, 2009), <https://www.reuters.com/article/us-climate-japan/japan-pm-elect-backs-25-percent-greenhouse-gas-cut-idUSTRE5860G420090907>.

<sup>15</sup> Takashi Kitazume, *For energy security, Japan urged to diversify sources*, JAPAN TIMES (Nov. 24, 2012), <https://www.japantimes.co.jp/news/2012/11/24/business/for-energy-security-japan-urged-to-diversify-sources/>.

<sup>16</sup> *Japan election: Shinzo Abe and LDP in sweeping win - exit poll*, BBC (Dec. 16, 2012), <https://www.bbc.com/news/world-asia-20745165>.

<sup>17</sup> AGENCY FOR NATURAL RESOURCES AND ENERGY, *What's new?*, <http://www.enecho.meti.go.jp/en/>.

<sup>18</sup> AGENCY FOR NATURAL RESOURCES AND ENERGY, *English provisional translation of Japan's new Strategic Energy Plan*, (April 2014) at 24, [http://www.enecho.meti.go.jp/en/category/others/basic\\_plan/pdf/4th\\_strategic\\_energy\\_plan.pdf/](http://www.enecho.meti.go.jp/en/category/others/basic_plan/pdf/4th_strategic_energy_plan.pdf/).

<sup>19</sup> See Nuclear Regulation Authority, FY 2016 Annual Report, <http://www.nsr.go.jp/data/000253873.pdf>.

power plants were under the safety review of the Nuclear Regulation Authority.<sup>20</sup> Additionally, in the United States, the Trump administration began rolling back the climate change regulations that began under the Obama administration.<sup>21</sup> However, the Japanese government did not change its attitude toward energy policy after the administration changed in 2012, except for reactivating the nuclear power plants.<sup>22</sup>

Climate change requires local governments to deal with several difficult tasks using limited resources. Climate action requires appropriate data, time and human and financial resources. A non-governmental organization called the Japan Climate Change Initiative was established to help local government climate promote climate change efforts within and between public and private sectors.<sup>23</sup> The Initiative cooperates with local governments to reverse the effects of climate change.<sup>24</sup> It is difficult for local governments to achieve Japan's ambitious goal of meeting the standards of the Paris Agreement without help from non-state actors.<sup>25</sup>

## B. *Climate Change Adaptation Law*

To meet its obligations under the Paris Agreement, Japan needs to reduce its emissions by 26 percent of its 2013 levels by 2030.<sup>26</sup> After the Great East Japan Earthquake of 2011, the Japanese government reactivated some nuclear power plants and decommissioned others.<sup>27</sup> It also shifted to using coal power plants and established new power reactors.<sup>28</sup>

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<sup>20</sup> *See id.*

<sup>21</sup> Nadja Popovich, et al., *The Trump Administration is Reversing 100 Environmental Rules. Here's the Full List*, N.Y. TIMES (July 15, 2020), <https://www.nytimes.com/interactive/2020/climate/trump-environment-rollbacks.html>.

<sup>22</sup> Editorial, *Clear message needed to boost renewable energy*, JAPAN TIMES (May 27, 2019), <https://www.japantimes.co.jp/opinion/2018/05/27/editorials/clear-message-needed-boost-renewable-energy/#.XZnKMkb7TD4>.

<sup>23</sup> *Japan Climate Change Initiative*, <https://japanclimate.org/english/>.

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

<sup>25</sup> *Id.* at 37, 41.

<sup>26</sup> Chisato Takaka, *Japan continues to rely on coal-fired plants despite global criticism*, JAPAN TIMES (Oct. 9, 2018), <https://www.japantimes.co.jp/news/2018/10/09/reference/japan-continues-rely-coal-eyes-coal-fired-plants-despite-global-criticism/>.

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

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

There are two approaches to responding to climate change: mitigation and adaptation.<sup>29</sup> Mitigation means reducing GHG by reviewing the root causes.<sup>30</sup> Adaptation seeks to avoid the risks and effects of climate change.<sup>31</sup> In 1998, the Japanese parliament passed the Act on the Promotion of Global Warming Countermeasures,<sup>32</sup> but it did not include a statute for adaptation until the climate adaptation law was established in December 2018.<sup>33</sup> The Act aims to promote taking action to fight climate change.<sup>34</sup>

The Ministry of the Environment has taken a leading role in drafting the adaptation statute.<sup>35</sup> The effects of climate change are evident and demand quick governmental action. In November 2018, the cabinet announced its first plan.<sup>36</sup> The central government specified seven fields to address: 1) agriculture, forestry and fisheries; 2) water, environment and resources; 3) natural ecosystems; 4) natural disasters; 5) human health; 6) industries and economic activities; and 7) life of citizens.<sup>37</sup>

The act required governments to review their climate adaptation plans every five years,<sup>38</sup> encouraged local governments to establish regional climate change adaptation centers,<sup>39</sup> and permitted several local governments to share joint centers.<sup>40</sup> Local governments can draft climate change policies using data provided by these centers.<sup>41</sup>

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<sup>29</sup> NASA, *Responding to Climate Change*, <https://climate.nasa.gov/solutions/adaptation-mitigation/>.

<sup>30</sup> *Id.*

<sup>31</sup> *Id.*

<sup>32</sup> CHIKYŪ ONDANKA TAISAKU NO SUISHIN NI KANSURU Hō [Act on Promotion of Global Warming Countermeasures], Act No. 117 of 1998.

Translation is available at:

<http://www.japaneselawtranslation.go.jp/law/detail/?id=97&vm=04&re=01&new=1>.

<sup>33</sup> KIKŌ HENDŌ TEKIO Hō [Climate Change Adaptation Act], Act No. 50 of 2018.

Translation is available at:

[http://www.japaneselawtranslation.go.jp/law/detail\\_main?re=02&vm=04&id=3212](http://www.japaneselawtranslation.go.jp/law/detail_main?re=02&vm=04&id=3212).

<sup>34</sup> *Id.* at Art.1.

<sup>35</sup> MINISTRY OF ENVIRONMENT, *On National Plan for Adaptation to the Impacts of Climate Change* (Nov. 15, 2015), <https://www.env.go.jp/en/headline/2258.html>.

<sup>36</sup> MINISTRY OF ENVIRONMENT, *Climate Change Adaptation Act* (Jun. 2018),

<https://www.env.go.jp/en/earth/cc/adaptation/mat01.pdf>.

Cabinet decision, Kikō hendō tekiō keikaku,

<http://www.env.go.jp/earth/tekiou/tekioukeikaku.pdf>.

<sup>37</sup> *Id.* See also KIKŌ HENDŌ TEKIO Hō [Climate Change Adaptation Act], Act No. 50 of 2018, Art. 1. Translation is available at:

[http://www.japaneselawtranslation.go.jp/law/detail\\_main?re=02&vm=04&id=3212](http://www.japaneselawtranslation.go.jp/law/detail_main?re=02&vm=04&id=3212).

<sup>38</sup> *Id.* at Art. 5.

<sup>39</sup> *Id.* at Art. 14.

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

<sup>41</sup> *Id.* Art. 3(2).



Some newspapers have reported that local governments do not have enough specialists or financial resources to tackle climate change.<sup>42</sup> One serious concern is that local governments do not have sufficient data to predict specific climate change effects at the municipal level, though they are able to recognize climate change effects in general.<sup>43</sup> For example, if a local government needs to strengthen a seawall, it may need a larger budget. Additionally, local governments must often work with neighboring prefectures since climate change does not stop at the border.

Another tool for local governments to promote climate change action is the National Institute for Environmental Studies, which provides a platform called “A-Plat.”<sup>44</sup> A-Plat offers a training course to public officials from local governments and helps them collaborate with private companies regarding precautionary measures aimed at mitigating harmful effects of climate change, such as the increase in heat strokes.<sup>45</sup>

### C. *Local Governments’ Climate Change Tasks*

The current constitution gives local governments the right to pass ordinances in their local assemblies.<sup>46</sup> In the Japanese parliamentary system, the Cabinet Legislation Bureau drafts most bills.<sup>47</sup> It is made up of legal experts selected from ministries to write bills.<sup>48</sup> They support Japan’s legislature.<sup>49</sup> Unlike the National Diet, local governments may not have excellent legal minds or the skills to make laws.<sup>50</sup>

Local governments have just begun researching climate change and lack the scientific data needed to support climate change adaption. With

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<sup>42</sup> Ai Oba, *70% of prefectures have not set up legally required centers to fight climate change*, THE MAINICHI (Jan. 18, 2019), <https://mainichi.jp/english/articles/20190128/p2a/00m/0na/004000c>.

<sup>43</sup> A-Plat, *Climate Change Adaptation Information Platform*, <https://adaptation-platform.nies.go.jp/en/lets/index.html>.

<sup>44</sup> A-Plat, *Climate Change Adaptation Information Platform Sectorial Measures*, <http://www.adaptation-platform.nies.go.jp/>.

<sup>45</sup> *Id.*

<sup>46</sup> NIHON KOKU KENPŌ [KENPŌ] [Constitution], art.94. Translation is available at: <http://www.japaneselawtranslation.go.jp/law/detail/?id=174&vm=04&re=01&new=1>.  
CHIHŌ JICHI HŌ [Local Autonomy Act] art.14.

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

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

<sup>49</sup> Yuichiro Tsuji, *Law Making Power in Japan - Legislative Assessment in Japan*, Korean Legislation Research, vol.10(1), 173-204 (2016).

<sup>50</sup> NIHON KOKU KENPŌ [KENPŌ] [Constitution], art. 41, 94 (Japan). Translation is available at: <http://www.japaneselawtranslation.go.jp/law/detail/?id=174&vm=04&re=01&new=1>.

help from the National Institute for Environmental Studies, the Ministry of the Environment finally provided the first climate change action guidelines for local governments in 2016.<sup>51</sup> The Ministry assists local government officials in creating roadmaps to their goals, and helps them move through the process laid out in its guidelines.<sup>52</sup> Local governments must establish structures to promote adaptation and address climate change, review future effects, make predictions, and share information with residents.<sup>53</sup>

The central government continues to lead climate change action in Japan through both mitigation and adaptation. Before reviewing the adaptation plan for Tokyo in chapter II, we will look at several examples addressing agriculture, natural disasters, and public health to show the uniqueness of strategies local governments in Japan are taking to adapt.

### 1. *Agricultural adaptation*

Agricultural adaptation combines Japan's technological efforts to address climate change and the country's unique ideas on farm products. The Ministry of Agriculture, Forestry, and Fisheries reports that Japanese people are westernizing their dietary habits but still need rice.<sup>54</sup> Japanese people are proud of the high quality of Japanese rice, but higher temperatures would prevent the growth of first-class rice in rural areas.<sup>55</sup> In 2011, the Great East Japan Earthquake destroyed large rice-growing areas in Fukushima.<sup>56</sup> This earthquake led to harmful rumors and misinformation about agricultural products. In the meantime, the region of rice cultivation has moved north to Hokkaido.<sup>57</sup>

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<sup>51</sup> A-Plat, *supra* note 43.

<sup>52</sup> Cabinet Decision, *National Plan for Adaptation to the Impacts of Climate Change* (Nov. 27, 2015), <http://www.env.go.jp/en/focus/docs/files/20151127-101.pdf>.

<sup>53</sup> *Id.*

<sup>54</sup> MINISTRY OF AGRICULTURE, FORESTRY AND FISHERIES, RICE, *Secrets behind delicious Japanese rice: climate, people and technology*, <https://www.maff.go.jp/e/oishii/ingredients/rice.html>.

<sup>55</sup> Eric Johnston, *Climate change threatens nation's agriculture*, JAPAN TIMES (Aug. 6, 2016), <https://www.japantimes.co.jp/life/2016/08/06/environment/climate-change-threatens-nations-agriculture/>.

<sup>56</sup> Shuji Ozaki, *Returnee Fukushima farmers offer taste of rice cultivation in hopes of revitalization*, THE MAINICHI (Jun. 10, 2018), <https://mainichi.jp/english/articles/20180610/p2a/00m/0na/005000c>.

<sup>57</sup> Toshihiko Sugiura, *Three Climate Change Adaptation Strategies for Fruit Production*, 277-292, [https://www.naro.affrc.go.jp/english/laboratory/niaes/files/fftc-marco\\_book2019\\_277.pdf](https://www.naro.affrc.go.jp/english/laboratory/niaes/files/fftc-marco_book2019_277.pdf).

Japanese apples and oranges are famous for their flavor and distinct round shape.<sup>58</sup> However, in recent years, these crops have been sunburned by increases in harsh sunlight, and changes to plant transpiration patterns caused by climate change have hindered growth.<sup>59</sup> The resulting light colored fruits and those with split skin lose commercial value.<sup>60</sup> Now, farmers must use cloth to cover and shield their crops against strong sunlight<sup>61</sup> because Japanese customers expect consistent, beautiful and unblemished fruit.<sup>62</sup>

Some farms have tried to adapt their marketing to make up for certain climate change related losses. For example, when Aomori farms experienced a strong typhoon, most of its apples fell.<sup>63</sup> Usually, fallen apples are not sold.<sup>64</sup> When Aomori farmers found the apples that had not fallen, they labeled and sold them as “miracle unfallen apples.”<sup>65</sup> Japanese students bought them during examinations, hoping not to fail (fall).<sup>66</sup> This sale covered the deficit caused by the fallen apples.<sup>67</sup> Interestingly enough, this story was made into a movie.<sup>68</sup>

The Ministry of Agriculture, Forestry, and Fisheries (“MAFF”) also encourages local governments to use innovations in robotics, information, and communication technology.<sup>69</sup> For example, Wakayama University is leading a joint research project on robotic suits that could help older employees with physical tasks.<sup>70</sup> Additionally, because Japan’s society is aging, it is beginning to welcome technology and robotics to replace jobs once held by the working class.<sup>71</sup> For instance,

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<sup>58</sup> MINISTRY OF AGRICULTURE, FORESTRY AND FISHERIES, *Climate Change Adaptation Plan of Ministry of Agriculture, Forestry and Fisheries*, [https://www.maff.go.jp/j/kanbo/kankyo/seisaku/pdf/pdf/tekiou\\_eng.pdf](https://www.maff.go.jp/j/kanbo/kankyo/seisaku/pdf/pdf/tekiou_eng.pdf).

<sup>59</sup> *Id.*

<sup>60</sup> SUGIURA, *supra* note 57.

<sup>61</sup> *Id.*

<sup>62</sup> *Id.*

<sup>63</sup> Movie, *Kiseki no ringo [Miracle Apple]* (2013).

This unique demand of the Japanese customer may need not only sales effort of farms but also changing people's way of thinking.

<sup>64</sup> *Id.*

<sup>65</sup> *Id.*

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

<sup>67</sup> *Id.*

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

<sup>69</sup> *Efforts for Creating Strong Agricultural Structure*, <http://www.maff.go.jp/e/data/publish/attach/pdf/index-56.pdf>.

<sup>70</sup> *Nikkei Shimbun, Nōka Otasuke sūtsu hanbai [Sale for assist suits]* (Oct.13, 2018), <https://www.nikkei.com/article/DGXMZO36433340S8A011C1LKA000/>.

<sup>71</sup> Fumika Mizuno, *2020 Tokyo Olympic Games can't rescue Japan*, JAPAN TIMES (Aug. 6, 2019),

Hokkaido University invented a method for installing a GPS receiver and remote control into a farm machine,<sup>72</sup> which MAFF implemented when they released safety review guidelines for farm machines.<sup>73</sup>

## 2. *Adapting to natural disasters.*

There have been many natural disasters in Japan. Natural disasters expose the government to liability when it fails to take necessary adaptation measures.<sup>74</sup> From June to July 2018, a spell of concentrated, heavy rain caused severe damage over several prefectures in West Japan.<sup>75</sup> Furthermore, Heavy rain has been breaking weather records every year.<sup>76</sup> Some regions have not recovered yet, so the government decided to extend its support to small and medium-sized enterprises in January 2019.<sup>77</sup>

The Japanese people share the burden of recovering from damages accidentally caused by natural disasters.<sup>78</sup> In 1962, the Japanese government established an act concerning Special Financial Support for Dealing with Designated Disasters of Extreme Severity.<sup>79</sup> Under this act, the government may issue a ministerial order to designate regions and businesses that are damaged beyond a certain standard and in need of

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<https://www.japantimes.co.jp/opinion/2019/08/06/commentary/japan-commentary/2020-tokyo-olympic-games-cant-rescue-japan/>.

<sup>72</sup> Hokkaidō University, Laboratory on Vehicle Robotics. Available at:

<https://www.agr.hokudai.ac.jp/r/lab/vehicle-robotics>.

<sup>73</sup> MINISTRY OF AGRICULTURE, FORESTRY AND FISHERIES, *Smart Agriculture*, [https://www.maff.go.jp/e/policies/tech\\_res/smaagri/robot.html](https://www.maff.go.jp/e/policies/tech_res/smaagri/robot.html).

<sup>74</sup> Yuichiro Tsuji, *Forgotten People: A Judicial Apology for Leprosy Patients in Japan*, 19 OR. REV. INT'L L. 233, 223–257 (2018) (discussing the government owes liability to take care of leprosy patients after treatment was found).

<sup>75</sup> Jason Samenow, *Japan reeling from worst flood in decades*, WASHINGTON POST (Jul. 11, 2018), <https://www.washingtonpost.com/news/capital-weather-gang/wp/2018/07/10/japan-reeling-from-worst-flood-in-decades-weve-never-experienced-this-kind-of-rain-before/>.

<sup>76</sup> *Id.*

<sup>77</sup> METI, Heisei 30 nen 5 gatsu 20 nichi kara 7 gatsu 10 nichi made no aida no gōu oyoī bōfū ni yoru saigai ni kansuru hisai chūsho kigyō shōkibo jigyōsha sien saku wo enchō simasu [Announcement to extend support to small and medium size companies for damages by heavy rain from 20, May to 10, July in 2018] (Jan.19, 2019). Available at: <http://www.meti.go.jp/press/2018/01/20190125004/20190125004.html>.

<sup>78</sup> Yuichiro Tsuji, *Reflection of Public Interest in the Japanese Constitution: Constitutional Amendment*, 46 DENV. J. INT'L L. & POL'Y 159, 159 (2018).

<sup>79</sup> KYOKUTAN NA JŪDAI-DO NO SHITEI SAIGAI NI TAISHO SURU TAME NO TOKUBETSUNA ZAISEI SHIEN NI KANSURU HŌ [Act concerning Special Financial Support to Deal with the Designated Disaster of Extreme Severity], Act No. 99 of 2000 (Japan). Translation is available at:

[http://www.japaneselawtranslation.go.jp/law/detail\\_main?re=&vm=2&id=803](http://www.japaneselawtranslation.go.jp/law/detail_main?re=&vm=2&id=803).

support.<sup>80</sup> In 1999, the standard to receive support was relaxed, and the government now provides the budget for most remedies to damages caused by typhoons and earthquakes.<sup>81</sup> For example, this act also covered the 2011 Great East Japan earthquake.<sup>82</sup> Natural disasters are so frequent now that the government began issuing designations every year, starting in 2011.<sup>83</sup> Climate change may increase the probability of natural disasters occurring.<sup>84</sup>

In August 1986, the Miyagi prefecture experienced a dangerous typhoon that caused a flood.<sup>85</sup> A flood this size was only supposed to happen once every 200 years. The total amount of continuous rainfall was more than 400 millimeters.<sup>86</sup> Seven rivers were breached in eleven locations and ninety nine rivers were flooded.<sup>87</sup> The flood caused over 1,724 damage cases.<sup>88</sup> The Miyagi prefecture learned that a serious natural disaster was expected again and started to research how to become flood resilient,<sup>89</sup> which would require the installation of emergency drainage gutter pipes, marginal strips, and backup levees.<sup>90</sup>

After flooding disasters, residents near rivers may bring suit against the national government to seek damages under the State Redress Act.<sup>91</sup> The provisions of this act are brief and require judicial interpretation in

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<sup>80</sup> GEKI JIN SAIGAI NI TAISHO SURU TAME NO TOKUBETSU NO ZAISEI ENJO TŌ NI KANSURU HŌ [Act on Special Financial Aid to Cope with Severe Natural Disaster], Act no. 150 of 1962 (Japan).

See also Cabinet Office & Government of Japan, *Disaster Management in Japan*, [http://www.bousai.go.jp/1info/pdf/saigaipanf\\_e.pdf](http://www.bousai.go.jp/1info/pdf/saigaipanf_e.pdf).

<sup>81</sup> HISAISHA SEIKATSU SAIKEN SIEN HŌ [Act Concerning Support for Reconstructing Livelihoods of Disaster Victims], Act. No. 66 of 1998 (Japan). Translation available at:

<http://www.japaneselawtranslation.go.jp/law/detail/?id=3026&vm=04&re=01&new=1>.

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

<sup>83</sup> Cabinet Office, *White Paper on Disaster Management 2019* (working paper) [http://www.bousai.go.jp/en/documentation/white\\_paper/2019.html](http://www.bousai.go.jp/en/documentation/white_paper/2019.html).

<sup>84</sup> Al Diaz, *Climate change means the government faces more costs from natural disasters*, NBC (Oct. 1, 2019), <https://www.nbcnews.com/think/opinion/climate-change-means-government-faces-more-costs-natural-disasters-if-ncna1059901>.

<sup>85</sup> Miyagi prefecture, Miyagi suigai kiroku shu [Report on Miyagi flood] (Dec. 2, 2012), <https://www.pref.miyagi.jp/soshiki/kasen/suigai-s61-taihuu10gou.html>.

<sup>86</sup> Miyagi prefecture, Miyagi suigai kiroku shū (Record of Miyagi flood in 1986). <https://www.pref.miyagi.jp/soshiki/kasen/suigai-s61-taihuu10gou.html>.

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

<sup>88</sup> *Id.*

<sup>89</sup> MINISTRY OF LAND, INFRASTRUCTURE AND TRANSPORT, *Adaptation to climate change*, [https://www.mlit.go.jp/river/basic\\_info/english/index.html](https://www.mlit.go.jp/river/basic_info/english/index.html).

<sup>90</sup> *Id.*

<sup>91</sup> KOKKA BAISHO HŌ [State Redress Act], Act. No.125 of 1947 (Japan).

Translation available at:

<http://www.japaneselawtranslation.go.jp/law/detail/?id=1933&vm=04&re=01&new=1>.

the courts. In Article 2 of the State Redress Act, the government assumes responsibility for damages caused by a defect in the placement or construction of a road, river, or other public structure.<sup>92</sup>

Under Japanese case law, rivers are covered by Article 2, and any river that has a defect covered by Article 2 lacks regular safety.<sup>93</sup> In 1984, the Japanese Supreme Court clarified the conditions for Article 2 liability.<sup>94</sup> The Court explained that even rivers under construction may be the cause of government liability for flood conditions if the court reviews several factors, such as the (1) size, (2) frequency, (3) cause of flooding, (4) character of the damage, and (5) social concerns, like land use and emergencies that demand quick repairs.<sup>95</sup> The judiciary recognized that the government has limited resources, but said it needed to review whether similar floods could occur in similarly sized rivers.<sup>96</sup> Especially for rivers under construction, the court reviews past flood disasters and determines liability based on whether safety measures are unreasonable under the general standards for river safety. If a deficit is apparent for the parts of the river that are under construction, the court demands immediate repairs.

Today climate change makes it difficult to predict severe natural disasters. Since predicting the effects of climate change action is difficult, the government may make wrong predictions for repairs. In 1990, the Supreme Court addressed the Tama river flood case using a three prong test to determine governmental liability.<sup>97</sup> First, even when the government deemed that a river did not need repair, it was still liable if the river's safety was not maintained based on typical flooding.<sup>98</sup> Second, the court reviewed many factors, such as the (1) size, (2) cause, (3) frequency of floods, (4) nature of the damages, (5) natural conditions, such as rain, and (6) social conditions, like land use and the overall limits of finance, technology, and society.<sup>99</sup> Based on these factors, it decided if inaction or failure to repair the river constituted a "defect" under Article

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<sup>92</sup> *Id.* at Art.2. When damage to another person is caused because of a defect in the placement or administration of a road, river, or other public structure, the State or public entity shall assume the responsibility to compensate therefor.

<sup>93</sup> Saikō Saibansho [Sup. Ct.] Aug. 20, 1970, Showa 42 (o) no. 921, 24(9) SAIBANSHO SAIBANREI JŌHŌ [SAIBANSHOWEB]1268, <http://www.courts.go.jp> (Japan) (In this case, one-meter rock fell into passenger seat of car.).

<sup>94</sup> Saikō Saibansho [Sup. Ct.] Jan. 26, 1984, Showa 53 (o) no. 492, 38(2) SAIBANSHO SAIBANREI JŌHŌ [SAIBANSHOWEB]53, <http://www.courts.go.jp> (Japan).

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

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

<sup>97</sup> Saikō Saibansho [Sup. Ct.] Dec. 13, 1990, Showa 63 (o) no. 791, 44(9) SAIBANSHO SAIBANREI JŌHŌ [SAIBANSHOWEB]1186, <http://www.courts.go.jp> (Japan).

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

<sup>99</sup> *Id.*

2.<sup>100</sup> Third, the court reviewed if a river was unsafe according to the standards of the 1984 decision.<sup>101</sup>

These cases addressing natural disasters under Article 2 show that in designating areas that may experience damages, the government must provide building codes by the local ordinances and investigate building construction sites to avoid liability. The government is also required to provide hazard maps for local inhabitants.<sup>102</sup>

Existing preventive measures might still be futile when an unexpected natural disaster occurs, such as the West Japan heavy rain of 2018.<sup>103</sup> Under the Disaster Countermeasures Basic Act,<sup>104</sup> the local government must take three steps: prepare the region for evacuation, advise residents to evacuate, and order evacuation. Even though the last phase is the strongest and uses the word “order,” it has no legally binding power.<sup>105</sup>

During the 2018 flood in West Japan, residents failed to evacuate despite an evacuation advisory followed by an evacuation order.<sup>106</sup> Inhabitants told news reporters that they failed to evacuate because previous floods had not been as dangerous and they did not want to leave their homes.<sup>107</sup>

The 2018 flood was not the first time Japanese citizens failed to take natural disasters seriously. In 1972 and 1976, floods occurred in the Okayama prefecture where two rivers cross and the government planned to repair its construction.<sup>108</sup> Hazard maps were distributed, but again the residents did not take it seriously.<sup>109</sup> These examples show why the

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<sup>100</sup> *Id.*

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

<sup>102</sup> MINISTRY OF LAND, INFRASTRUCTURE AND TRANSPORT, *Flood Hazard Mapping Manual in Japan*, iv (June, 2005),

[http://www.icharm.pwri.go.jp/publication/pdf/2005/flood\\_hazard\\_mapping\\_manual.pdf](http://www.icharm.pwri.go.jp/publication/pdf/2005/flood_hazard_mapping_manual.pdf).

<sup>103</sup> Asahi Shimbun, Hazaado mappu to kasanatta sinsui iki soredemo giseisha fusegezu [Even though hazard map covers flooded area, victims cannot be saved] (Jul. 10, 2018), <https://www.asahi.com/articles/ASL7956K2L79PTIL02N.html>

<sup>104</sup> SAIGAI TAISAKU KIHON HŌ [Disaster Countermeasures Basic Act, Act No. 223 of 1961, art.60 (Japan). Translation available at:

<http://www.japaneselawtranslation.go.jp/law/detail/?id=3322&vm=&re=&new=1>.

<sup>105</sup> *Id.*

<sup>106</sup> Shigeto Hanazawa et al., *Residents underestimated rain disaster flooding that washed away Kurashiki homes*, THE MAINICHI (Jul. 20, 2018),

<https://mainichi.jp/english/articles/20180720/p2a/00m/0na/021000c>.

<sup>107</sup> *Id.*

<sup>108</sup> Asahi Shimbun, Uneru Dakuryū Afureruzo! Hinan kobamu jumin ni kenmei no settoku [Hard Persuasion to inhabitants who resist in swelling muddy flow] (Aug. 14, 2018),

[https://www.asahi.com/articles/ASL7042SFL70PTIL00M.html?iref=pc\\_rellink\\_01](https://www.asahi.com/articles/ASL7042SFL70PTIL00M.html?iref=pc_rellink_01).

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

cabinet office regularly reviews and revises guidelines for evacuation orders.<sup>110</sup>

### 3. *Adapting public health.*

The average temperature in Japan rose 1.1 °C from 1898 to 2017.<sup>111</sup> Since the 1990s, there have been record high temperatures.<sup>112</sup> As a result of rising temperatures, the Fire and Disaster Management Agency reported that the number of heat stroke patients is increasing.<sup>113</sup> From July to September in 2008, heat stroke affected 23,071 people.<sup>114</sup> From May to September 2018, heat stroke cases rose to 95,137 people.<sup>115</sup> Out of those effected, 45.3 percent were people over 65 years old.<sup>116</sup> High temperature causes heat stroke indoors, affecting elderly people 31.2 percent of the time.<sup>117</sup>

The heat also affects the youth. In Japanese public schools, air conditioning is not widely available. According to the Ministry of Education, Culture, Sports, Science, and Technology, there is air conditioning in only 49.6 percent of elementary and junior high schools in Japan.<sup>118</sup> In 2018, a primary student passed away from a heat stroke.<sup>119</sup> The teacher had taken the students for an excursion to the nearest park in the morning in July.<sup>120</sup> The temperature was over 33 °C.<sup>121</sup> It took 20 minutes for the walk.<sup>122</sup> By 11 a.m., the temperature reached 33.4°C.<sup>123</sup> Despite the heat, the school did not stop the excursion.<sup>124</sup> At 11:50 a.m.,

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<sup>110</sup> See e.g., Cabinet office, *White Paper on Disaster Management in Japan*, working paper, [http://www.bousai.go.jp/kaigirep/hakusho/pdf/H30\\_hakusho\\_english.pdf](http://www.bousai.go.jp/kaigirep/hakusho/pdf/H30_hakusho_english.pdf).

<sup>111</sup> Editorial, *Don't Repeat Lost Decade on Climate Action*, JAPAN TIMES (Jan. 23, 2020), <https://www.japantimes.co.jp/opinion/2020/01/23/editorials/dont-repeat-lost-decade-climate-action/>.

<sup>112</sup> Meteorological Agency, *Tables of Climatological Normals (1981–2010)*, <https://www.data.jma.go.jp/obd/stats/data/en/normal/normal.html>.

<sup>113</sup> FIRE AND DISASTER MANAGEMENT AGENCY, *Kinkyū hanso jokyo [Emergency transport]*, [http://www.fdma.go.jp/neuter/topics/fieldList9\\_2.html](http://www.fdma.go.jp/neuter/topics/fieldList9_2.html).

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

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

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

<sup>117</sup> *Id.*

<sup>118</sup> *Cool for School? The AC Gap in Japanese Classrooms*, NIPPON (Jul. 24, 2018), <https://www.nippon.com/en/features/h00248/>.

<sup>119</sup> Sachio Nakajima, *6-year-old boy dies from heatstroke after field study*, THE MAINICHI (Jul. 18, 2018), <https://mainichi.jp/english/articles/20180718/p2a/00m/0na/003000c>.

<sup>120</sup> *Id.*

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

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

<sup>123</sup> *Id.*

<sup>124</sup> *Id.*



shortly after the excursion, one of the schoolboys lost consciousness on the way back to school and passed away that afternoon.<sup>125</sup>

While the government may release regular reports and warnings when necessary, it is difficult to control general human activity solely by law. Governmental action is imperfect, but it is still expected to provide guidelines for schoolteachers to stop excursions during heat waves. The Ministry of the Environment issued a manual for public schools.<sup>126</sup> It limits the discretion of teachers and protects them in situations like the above.<sup>127</sup>

## II. ADAPTATION IN THE TOKYO METROPOLITAN AREA

In this chapter, we will review the adaptation actions of the Tokyo metropolitan area. Tokyo is ranked 45th out of 47 prefectures in size, but its population and gross prefectural production, including urban and suburban areas, rank among the top urban and suburban areas.<sup>128</sup> As the largest city in Japan, Tokyo dialogues with other cities around the world.<sup>129</sup> It aims to promote conversations with other cities in order to tailor their experiences towards combating climate change.<sup>130</sup> Mayors from several cities and the governor gave talks and shared experiences at the Tokyo Forum for Clean City and Clear Sky.<sup>131</sup>

As the largest city, Tokyo is fortunate in that its tax revenues enable it to implement a large-scale adaptation action plan.<sup>132</sup> Despite this, the large scale of Tokyo means it may not be an appropriate example for smaller cities in Japan. Nonetheless, innovative ordinances have been established in Tokyo, making it a leading example for other large, local governments.

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<sup>125</sup> Louise George Kittaka, *Some schools in Japan need educating about the dangers of heat stroke*, JAPAN TIMES (Aug. 14, 2016), <https://www.japantimes.co.jp/community/2016/08/14/how-tos/schools-japan-need-educating-dangers-heat-stroke/>.

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

<sup>127</sup> Kasana Nakamura, *Students suffer heatstroke as schools lack air conditioners, prevention measures*, THE MAINICHI (Jun. 31, 2018), <https://mainichi.jp/english/articles/20180731/p2a/00m/0na/015000c>.

<sup>128</sup> Statistics Japan, *Gross Production*, <https://stats-japan.com/t/kiji/10709>.

<sup>129</sup> See e.g., Tokyo Forum for Clean City & Clear Sky: International Environmental Conference, May 22–23, 2018 (May 21, 2018), [http://www.kankyo.metro.tokyo.jp/en/automobile/tokyoforum2018.files/tokyo\\_forum\\_flyer.pdf](http://www.kankyo.metro.tokyo.jp/en/automobile/tokyoforum2018.files/tokyo_forum_flyer.pdf).

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

<sup>131</sup> *Id.*

<sup>132</sup> Ryusei Takahashi, *Tokyo Zero Emission Plan*, JAPAN TIMES (Jan. 26, 2020), <https://www.japantimes.co.jp/news/2020/01/26/national/zero-emission-tokyo-plan/>.

Chapter 8 of the Japanese Constitution concerns local governments.<sup>133</sup> Local legislative assemblies may pass their own ordinances to the extent permitted by the law.<sup>134</sup> They may also establish stricter and more extensive standards so long as the appropriate statute permits them.<sup>135</sup> There are only four provisions in Chapter 8.<sup>136</sup> In 1975, the Japanese Supreme Court explained that the local legislative assemblies may only regulate by penalties and restrictions that are more severe and with a broader scope if they do not conflict with national statutes.<sup>137</sup> The court reviews terms and provisions for their meanings, purposes, and effects to identify any conflicts between local ordinances and statutes.<sup>138</sup>

A local legislative assembly may pass an ordinance with a different purpose.<sup>139</sup> When the statute and ordinance share a purpose, the court reviews whether the ordinance presents a more severe or broader scope.<sup>140</sup> Even if there is no regulation in the statute, the court will deem the local ordinance unconstitutional if the National Diet has intentionally left an issue unregulated.<sup>141</sup> If a statute does regulate an entity or activity, the court will allow an ordinance with a different purpose if it does not conflict with the statute's purpose and effect.<sup>142</sup> The court reviews whether the statute achieves a national minimum.<sup>143</sup>

Tokyo's climate change actions cover a wide range of activities. One activity is an energy labeling system created by the Bureau of the Tokyo

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<sup>133</sup> NIHON KOKU KENPŌ [KENPŌ] [Constitution], chap.8 (Japan).

Translation is available at:

<http://www.japaneselawtranslation.go.jp/law/detail/?id=174&vm=04&re=01&new=1>.

<sup>134</sup> *Id.* at Art. 94. See also Yuichiro Tsuji, *Local Autonomy and Japanese Constitution - David and Goliath*, 8 KJLL 2, 43-68 (2018).

<sup>135</sup> Toshiyuki Nonaka, Mutsuo Nakamura et al, *Kenpo II (Constitution II)*, at 422-424 (2012).

<sup>136</sup> NIHON KOKU KENPŌ [KENPŌ] [Constitution], art. 92-95 (Japan).

Translation is available at:

<http://www.japaneselawtranslation.go.jp/law/detail/?id=174&vm=04&re=01&new=1>.

<sup>137</sup> Saikō Saibansho [Sup. Ct.] Sep.10, 1975, Showa 48 (a) no. 910, 29(8) SAIBANSHO SAIBANREI JŌHŌ [SAIBANSHO WEB] 489, <http://www.courts.go.jp> (Japan). Known as "Tokushima Kōan Jōrei case." See also, Tsuji, *supra* note 134.

<sup>138</sup> *Id.*

<sup>139</sup> *Id.*

<sup>140</sup> *Id.*

<sup>141</sup> *Id.*

<sup>142</sup> *Id.*

<sup>143</sup> KEIKO SAKURAI AND HIRYOYUKI HASHIMOTO, *GYOSEI HŌ* [Administrative law] (2016), at 56.

Metropolitan Area.<sup>144</sup> This energy saving labeling system classifies household appliances into five classes.<sup>145</sup> If an appliance is a high energy saver, it receives five stars.<sup>146</sup> Another example is Tokyo's Global Warming Measurement Targets, which obligate large businesses to draft and submit plans to combat climate change.<sup>147</sup> These adaptation measures align with existing policies from the national government.

Compared to other compartmentalized public administrations, several bureaus of the Tokyo government are smaller and work together more efficiently. This places Tokyo in a better position to make adaptation policies. It also helps advance and encourage national legislation and administrative agendas. However, if the national government sets a ceiling, Tokyo will not exceed that national standard.

Unlike the United States Clean Air Act,<sup>148</sup> which allows California to waive federal regulation and allows other states to select California or federal regulation, in Japan there is no special exception for subordinate governments to choose between the Tokyo standard or the general standard.<sup>149</sup> Thus, the Tokushima Kōan Jōrei case controls.<sup>150</sup> Unlike the battle between the Trump administration and the state of California, no serious conflicts between the Tokyo Metropolitan government and the Abe Cabinet exist.

#### A. *The History of Tokyo's Environmental Regulation*

The history of environmental regulation in Tokyo illustrates the city's development of advanced environmental regulations.<sup>151</sup> In the 1970s, the National Diet amended and passed several statutes on

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<sup>144</sup> TMG, *Outline of Tokyo Energy Efficiency Labeling System*, [https://www.kankyo.metro.tokyo.lg.jp/en/about\\_us/videos\\_documents/documents\\_1.files/labeling\\_system.pdf](https://www.kankyo.metro.tokyo.lg.jp/en/about_us/videos_documents/documents_1.files/labeling_system.pdf).

<sup>145</sup> *Id.*

<sup>146</sup> *Id.* (Explaining that the local legislative assemblies might regulate by penalties and restrictions that are more severe and with a broader scope only if they do not conflict with national statutes).

<sup>147</sup> See BUREAU OF THE ENVIRONMENT, Tokyo Metropolitan Government, Tokyo Cap-and-Trade Program (Mar. 2010), [https://www.kankyo.metro.tokyo.lg.jp/en/climate/cap\\_and\\_trade/index.files/Tokyo-cap\\_and\\_trade\\_program-march\\_2010\\_T.pdf](https://www.kankyo.metro.tokyo.lg.jp/en/climate/cap_and_trade/index.files/Tokyo-cap_and_trade_program-march_2010_T.pdf).

<sup>148</sup> 42 U.S.C 7543.

<sup>149</sup> ENVTL. PROTECTION AGENCY, *Regulations for Emissions from Vehicles and Engines*, <https://www.epa.gov/regulations-emissions-vehicles-and-engines/california-greenhouse-gas-waiver-request> (last visited Sept. 13, 2020).

<sup>150</sup> Tokushima Kōan Jōrei, *supra* note 137.

<sup>151</sup> *Green Local Government Portal*, TOKYO, [http://www.climate-lg.jp/en/innovative\\_projects/tokyo.html](http://www.climate-lg.jp/en/innovative_projects/tokyo.html).

environmental regulation.<sup>152</sup> These national environmental regulations began in conjunction with the Nixon administration's creation of the Environmental Protection Agency.<sup>153</sup> Prior to this, in 1969, California implemented their own clean air regulations.<sup>154</sup> Likewise, Tokyo passed the Tokyo Metropolitan Pollution Prevention Ordinance,<sup>155</sup> which was more advanced than the National Diet's statutes. In 2000, Tokyo amended its previous ordinance, the Tokyo Environmental Preservation Ordinance, to add appropriate uses of chemical substances, regulations to reduce environmental effects, and car pollution measures.<sup>156</sup> The Tokyo Environmental Preservation Ordinance's purposes include protecting the health of people in Tokyo, maintaining environmental safety, and passing a healthy environment on to the next generation.<sup>157</sup> In pursuit of these goals, Tokyo made dramatic revisions to its vehicle regulations.<sup>158</sup>

The government of Tokyo has a long history of trying to tackle climate change. For example, it has enacted regulations to control the heat island effect,<sup>159</sup> and in 2004, it shifted its purchasing focus and began opting for items and services that generated smaller environmental burdens.<sup>160</sup> These changes were the first in all the prefectures. Additionally, in 2020 Tokyo finalized the its cap and trade program.<sup>161</sup>

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<sup>152</sup> Junko Edahiro, *A Brief History of the Environmental Movement in Japan*, JAPAN FOR SUSTAINABILITY (Jul. 21, 2009),

[https://www.japanfs.org/en/news/archives/news\\_id029180.html](https://www.japanfs.org/en/news/archives/news_id029180.html).

<sup>153</sup> The Environmental Protection Agency was established by President Nixon in 1970. See Lily Rothman, *Here's Why the Environmental Protection Agency was Created*, TIME (Mar. 22, 2017), <https://time.com/4696104/environmental-protection-agency-1970-history/>.

<sup>154</sup> CAL. AIR RESOURCES BD., *History of California's Ambient Air Quality*, <https://ww2.arb.ca.gov/resources/documents/history-californias-ambient-air-quality-standards>.

<sup>155</sup> Tokyo to kōgai bōshi jōrei [Tokyo metropolitan pollution prevention ordinance], Ordinance No. 97 (Japan).

<sup>156</sup> This subchapter is discussed in Yuichiro Tsuji, *Climate law and policy in Japan- In A comparison with California* (forthcoming in working paper series with UC Berkeley).

<sup>157</sup> Ichie Tsunoda, *Tokyo's Role in Addressing Air Pollution in Japan*, JAPAN FOR SUSTAINABILITY (Mar. 31, 2005), [https://www.japanfs.org/en/news/archives/news\\_id027794.html#:~:text=In%20December%202000%2C%20the%20Tokyo,Tokyo%20Citizens%20Health%20and%20Safety.](https://www.japanfs.org/en/news/archives/news_id027794.html#:~:text=In%20December%202000%2C%20the%20Tokyo,Tokyo%20Citizens%20Health%20and%20Safety.)

<sup>158</sup> *Id.*

<sup>159</sup> Junko Edahiro, *Efforts in Japan to Mitigate the Urban Island Effect*, JAPAN FOR SUSTAINABILITY (Sept. 30, 2008),

[https://www.japanfs.org/en/news/archives/news\\_id027856.html](https://www.japanfs.org/en/news/archives/news_id027856.html).

<sup>160</sup> TOKYO METROPOLITAN GOV'T., *Tokyo Plastic Strategy*,

[https://www.kankyo.metro.tokyo.lg.jp/en/about\\_us/zero\\_emission\\_tokyo/strategy.files/FuII-ver.Plastic-strategy.pdf](https://www.kankyo.metro.tokyo.lg.jp/en/about_us/zero_emission_tokyo/strategy.files/FuII-ver.Plastic-strategy.pdf).

<sup>161</sup> TOKYO METROPOLITAN GOV'T., *Tokyo Cap-and-Trade*,

[http://www.kankyo.metro.tokyo.jp/en/climate/cap\\_and\\_trade/index.html](http://www.kankyo.metro.tokyo.jp/en/climate/cap_and_trade/index.html).

### B. Tokyo's Flood Measures

The Tama River flooded in Tokyo in 1974, and its inhabitants brought State Redress Act litigation against the national and Tokyo metropolitan governments. Since then, Tokyo has continually monitored and maintained the river to prevent this kind of flood. This subsection reviews several of the technologies and flood control systems used in the prevention of flooding.

Flood control in Tokyo has a long history.<sup>162</sup> To keep citizens and developers informed, Tokyo's Bureau of Sewage releases rain fall data.<sup>163</sup> It shows the seriousness of the situation utilizing different colors on the map. The Ministry of Land, Infrastructure, and Transport followed suit by launching a website with a searchable system for floods by geographic points that tries to cover all of Japan.<sup>164</sup> Additionally, the Meteorological Agency specifically records precipitation and Tokyo's water stages in the river.<sup>165</sup> The most vulnerable area might be the Edogawa ward, which has three rivers surrounding it.<sup>166</sup>

### C. ZEVs

Tokyo's climate change action faces the difficult challenge of perfecting the Zero Emission Vehicle ("ZEV"). In 2006, Tokyo released a goal to make a 30 percent reduction to the rate of GHG emissions by 2030.<sup>167</sup> In addition, Tokyo aims for a 60 percent reduction in the transportation sector.<sup>168</sup> Tokyo reevaluated its policy in 2018.<sup>169</sup> To achieve its goal by 2030, new automobiles and infrastructure are vital. In

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<sup>162</sup> Patricia Sippel, *Japan's First Urban Water Disaster: The Great Kanto Flood of 1742*, Gendai shi kenkyu of Toyo Eiwa University, Vol.10, 1-34, [https://toyoeiwa.repo.nii.ac.jp/?action=repository\\_uri&item\\_id=483](https://toyoeiwa.repo.nii.ac.jp/?action=repository_uri&item_id=483).

<sup>163</sup> BUREAU OF SEWAGE, Tokyo Amesh, <http://tokyo-ame.jwa.or.jp/en/index.html>.

<sup>164</sup> MINISTRY OF LAND, INFRASTRUCTURE AND TRANSPORT (MLIT), Chiten betsu Shinsui shumireshon kensaku sisutemu [website for searching system of flood by geographic point] <https://suiboumap.gsi.go.jp/>.

<sup>165</sup> TOKYO METROPOLITAN GOV'T., *Flood Control Integrated Information System*, [http://www.kasen-suibo.metro.tokyo.jp/im/tsim0101g\\_en.html](http://www.kasen-suibo.metro.tokyo.jp/im/tsim0101g_en.html).

<sup>166</sup> Edogawawa ward, *Edogawa hazard map*, <https://www.city.edogawa.tokyo.jp/documents/14537/wagayanobousaienglish.pdf>.

<sup>167</sup> BUREAU OF THE ENVIRONMENT, *TMG announces the "Zero Emission Tokyo Strategy" for contributing to the world's net-zero CO2 emissions by 2050* (Dec. 27, 2019), [https://www.kankyo.metro.tokyo.lg.jp/en/about\\_us/zero\\_emission\\_tokyo/strategy.html](https://www.kankyo.metro.tokyo.lg.jp/en/about_us/zero_emission_tokyo/strategy.html).

<sup>168</sup> *Id.*

<sup>169</sup> *Id.*

order to incentivize compliance, Tokyo used to subsidize only medium and small businesses that purchased ZEVs; it now subsidizes individual customers, large businesses, and the construction of hydrogen energy stations.<sup>170</sup>

In 2017, the Ministerial Council on Renewable Energy, Hydrogen and Related Issues unveiled a basic hydrogen strategy.<sup>171</sup> The strategy stems from the Japanese government's desire to be the leader in promoting and using hydrogen.<sup>172</sup> In order to accomplish this, Tokyo has a goal to increase the number of hydrogen stations to 35 by 2020, 80 by 2025, and 150 by 2030.<sup>173</sup> And, with regards to the number of hydrogen powered vehicles: 6000 by 2020, 100,000 by 2025, and 200,000 by 2030.<sup>174</sup> To meet this challenge, Japanese automakers developed production models of hydrogen fuel cell vehicles such as the Toyota Mirai<sup>175</sup> and the Honda Clarity Fuel Cell.<sup>176</sup> Honda designed the Clarity Fuel Cell with the aim of passing California's ZEV standard.<sup>177</sup> In 2016, Tokyo reached a basic agreement for promoting hydrogen with Fukushima prefecture, where the Great Eastern Japan Earthquake occurred in 2011.<sup>178</sup> Hydrogen produced in Fukushima will be used to fuel the Olympics village.<sup>179</sup>

In Japan, the Air Pollution Control Act regulates any vehicle in Japan as a mobile pollution source.<sup>180</sup> It further establishes environmental emission standards and designates areas for

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<sup>170</sup> *Fuel Cell Commercialization Conference of Japan* (Apr. 21, 2014), <http://fccj.jp/eng/index.html>.

<sup>171</sup> AGENCY FOR NAT. RESOURCES AND ENERGY, *Basic Hydrogen Strategy Determined* (Dec. 26, 2017), [http://www.meti.go.jp/english/press/2017/1226\\_003.html](http://www.meti.go.jp/english/press/2017/1226_003.html).

<sup>172</sup> *Id.*

<sup>173</sup> *Id.*

<sup>174</sup> *Id.*

<sup>175</sup> See Toyota, Mirai, <https://www.toyota.com/mirai/fuel.html>.

<sup>176</sup> See Honda, 2020 Clarity Fuel Cell Vehicle, <https://automobiles.honda.com/clarity-fuel-cell>.

<sup>177</sup> See Honda, 2017 Clarity Fuel Cell, [https://automobiles.honda.com/-/media/Honda-Automobiles/Vehicles/2017/Clarity-Fuel-Cell/Brochure/MY18\\_Clarify\\_FCV\\_Flyer.pdf](https://automobiles.honda.com/-/media/Honda-Automobiles/Vehicles/2017/Clarity-Fuel-Cell/Brochure/MY18_Clarify_FCV_Flyer.pdf).

<sup>178</sup> Stephen Edelstein, *Japan wants Fukushima to be major hydrogen production center*, GREEN CAR REPORTS (Jun. 2, 2016), [https://www.greencarreports.com/news/1104253\\_japan-wants-fukushima-to-be-major-hydrogen-production-center](https://www.greencarreports.com/news/1104253_japan-wants-fukushima-to-be-major-hydrogen-production-center).

<sup>179</sup> Fuel Cell & Hydrogen Energy Association, *Japan's Hydrogen Olympics* (May 25, 2020), <http://www.fchea.org/in-transition/2020/5/25/japans-hydrogen-olympics>.

<sup>180</sup> TAIKI OSEN BŌSI HŌ [Air Pollution Control Act], Act No. 97 of 1968 (Japan).

Translation is available at:

<http://www.japaneselawtranslation.go.jp/law/detail/?id=3561&vm=04&re=01&new=1>.

improvement.<sup>181</sup> Local governments may establish stricter or broader regulations as far as the statutes allow.<sup>182</sup>

The Tokyo Metropolitan Ordinance on Environmental Preservation obligates businesses that have over 30 cars in Tokyo to submit a plan for voluntary environmental activity.<sup>183</sup> The term of the plan is five years, and the Tokyo metropolitan government advises a company how to submit a correct report.<sup>184</sup> Consequences for incorrect or missing reports include administrative sanctions and the publishing of illegal business activity.<sup>185</sup>

In 2017, the Council for Fuel Regulation under the METI released a report for the new fuel efficiency standards for heavy vehicles.<sup>186</sup> METI aims to achieve the new standards by 2025: strengthening fuel efficiency standards for trucks by 13.4 percent to 7.63km per liter, and for buses by 14.3 percent to 6.52km per liter.<sup>187</sup> The METI allowed public comments on this report and promulgated the new standards for heavy vehicles.<sup>188</sup>

Under the Japanese constitution, as the Tokushima Kōan Jōrei case<sup>189</sup> suggested, a local government may pass an ordinance in the local legislative assembly if it does not conflict with statutes passed in the National Diet.<sup>190</sup> Japan does not struggle from issues of federalism,

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<sup>181</sup> JIDOSHA KARA HAISHUTU SARERU CHISSO SANKABUTSU OYOBİ RYUSI JO BUSTHITU NO TOKUTEI CHIIKI NI OKERU SORYOUNO SAKUGEN TO NIKANSURU TOKUBETSU HŌ [The Law Concerning Special Measures for Total Emission Reduction of Nox and PM Automobiles in Specified Areas], Act No.70 of 1992 (Japan).

Translation is available at: <https://www.env.go.jp/en/laws/air/amobile.html>.

<sup>182</sup> NIHON-KOKU KENPŌ [Constitution of Japan], art.94 (Japan).

Translation is available at:

<http://www.japaneselawtranslation.go.jp/law/detail/?id=174&vm=04&re=01&new=1>.

<sup>183</sup> TOKYO METROPOLITAN GOV'T., *Tokyo ZEV Promotion Strategy*,

[https://www.kankyo.metro.tokyo.lg.jp/en/about\\_us/zero\\_emission\\_tokyo/strategy.files/FuII-ver.ZEV-strategy.pdf](https://www.kankyo.metro.tokyo.lg.jp/en/about_us/zero_emission_tokyo/strategy.files/FuII-ver.ZEV-strategy.pdf).

<sup>184</sup> TOKYO METROPOLITAN GOV'T., *Diesel Vehicle Control* (Feb 9, 2019),

<https://www.kankyo.metro.tokyo.lg.jp/en/automobile/diesel.html>.

<sup>185</sup> TOKYO METROPOLITAN GOV'T., *Release of automobile environmental management* (Mar. 19, 2018) [www5.kankyo.metro.jp/vehicleplan/](http://www5.kankyo.metro.jp/vehicleplan/).

<sup>186</sup> AGENCY FOR NAT. RESOURCES AND ENERGY, *New Fuel Efficiency Standards for Heavy Vehicles Compiled* (Dec. 2017),

[https://www.meti.go.jp/english/press/2017/1212\\_001.html](https://www.meti.go.jp/english/press/2017/1212_001.html).

<sup>187</sup> *Id.*

<sup>188</sup> *Id.*

<sup>189</sup> Saikō Saibansho [Sup. Ct.] Sep.10, 1975, Showa 48 (a) no. 910, 29(8) SAIBANSHO SAIBANREI JŌHŌ [SAIBANSHO WEB] 489, <http://www.courts.go.jp> (Japan). Known as “Tokushima Kōan Jōrei case.” See also Tsuji, *supra* note 134.

<sup>190</sup> NIHON KOKU KENPŌ [KENPŌ] [Constitution], chap. 94 (Japan).

Translation is available at:

<http://www.japaneselawtranslation.go.jp/law/detail/?id=174&vm=04&re=01&new=1>.

because the Japanese constitution does not have a federal system and, on the issue of climate change, the central government promotes local regulation.<sup>191</sup> Nonetheless, it is not clear whether businesses outside Tokyo metropolitan can bring suits that the Tokyo Metropolitan Ordinance unconstitutionally discriminates against them.

#### D. *Other Climate and Adaptation Actions in Tokyo*

The Tokyo Cap and Trade System aimed to cover large scale businesses in 2008.<sup>192</sup> It was the first cap and trading system at the city level. It targeted businesses that annually consumed more than 1500kW of energy in their offices, commercial facilities, universities, or factories.<sup>193</sup> This system would cover 40 percent of the emissions from the industry sector.<sup>194</sup> In March 2020, Tokyo Certified seven “Top-Level Facilities” for outstanding global warming countermeasure efforts under the Tokyo cap and trade program.<sup>195</sup> Medium and small tenant owners may receive a subsidy from Tokyo if they make improvements to conserve energy in their buildings, by contract or memorandum.<sup>196</sup> Also, Tokyo supports medium and small businesses’ use of internet cloud services.<sup>197</sup>

The office of Tokyo’s Governor for Policy Planning regularly releases an action plan.<sup>198</sup> Tokyo subsidizes part of the establishment and management of the cogeneration or power interchanging system to implement demand responses.<sup>199</sup>

In conjunction with solar energy, Tokyo has also started a greenery project, requiring greenery plans and granting permission for developments that are over 1,000 square meter or 250 square meters for

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<sup>191</sup> *Id.* at Ch. 8.

<sup>192</sup> TOKYO METROPOLITAN GOV’T., *Tokyo Cap-and-Trade Program* (Mar. 26, 2020), <https://www.kankyo.metro.tokyo.lg.jp/en/climate/index.files/9thYearResult.pdf>.

<sup>193</sup> *Id.*

<sup>194</sup> *Id.*

<sup>195</sup> Press Release, TOKYO METROPOLITAN GOV’T., *Certifies Seven “Top-Level Facilities” for Outstanding Global Warming Countermeasure Efforts Under the Tokyo Cap-and-Trade Program* (Mar. 12, 2020), [https://www.kankyo.metro.tokyo.lg.jp/en/climate/index.files/TopLevel\\_202003.pdf](https://www.kankyo.metro.tokyo.lg.jp/en/climate/index.files/TopLevel_202003.pdf).

<sup>196</sup> TOKYO ENVIRONMENTAL MASTER PLAN (Mar. 2016), [https://www.kankyo.metro.tokyo.lg.jp/en/about\\_us/videos\\_documents/master\\_plan.files/5497a24cc603f33dbb96678fcf17135c.pdf](https://www.kankyo.metro.tokyo.lg.jp/en/about_us/videos_documents/master_plan.files/5497a24cc603f33dbb96678fcf17135c.pdf).

<sup>197</sup> *Id.*

<sup>198</sup> *Id.*

<sup>199</sup> TOKYO METROPOLITAN GOV’T., *Realize a world-leading “Smart City,”* <https://www.metro.tokyo.lg.jp/english/governor/speeches/2018/0221/06.html>.



public lands.<sup>200</sup> Applicants may add greenery to the rooftops of buildings to reduce the heat island effect and improve urban landscapes.<sup>201</sup> Tokyo has released guidelines for green curtains to help people save electricity.<sup>202</sup>

In 2014, Dengue fever was found in Tokyo.<sup>203</sup> Dengue is not endemic to Japan, but cases are increasing as the country becomes hotter.<sup>204</sup> The Japanese National Institute of Infectious Diseases soon followed the Taiwanese Guidelines for Dengue Control to make its own guidelines.<sup>205</sup> Tokyo needed to do a risk assessment for the spread of the infection and found several infectious cases, the local distribution, and population density.<sup>206</sup> In 1999, the Law on the Prevention of Infectious Diseases was established and classified Dengue fever as class 4.<sup>207</sup>

## CONCLUSION

Japan lacks effective studies on climate change actions and adaptation plans from a legal perspective.<sup>208</sup> Experiences of success and failure show the uniqueness of Japan's adaptation laws and may be helpful for other regions.

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<sup>200</sup> TOKYO METROPOLITAN GOV'T., *Green Building Program* (Feb. 9, 2018), <https://www.kankyo.metro.tokyo.lg.jp/en/climate/build.html>.

<sup>201</sup> *Id.*

<sup>202</sup> TOKYO GREEN BUILDING PROGRAM, C40 CITIES (Nov. 7, 2011), [https://www.c40.org/case\\_studies/tokyo-tokyo-metropolitan-government-green-building-program](https://www.c40.org/case_studies/tokyo-tokyo-metropolitan-government-green-building-program).

<sup>203</sup> Yuan et al., *Assessing dengue control in Tokyo, 2014*, PLOS NEGLECTED TROPICAL DISEASES, June 21, 2019.

<sup>204</sup> *Id.*

<sup>205</sup> *Health Crisis Management*,

[https://www.fukushihoken.metro.tokyo.lg.jp/joho/koho/publications/koho\\_bk/27/tokyo\\_fukuho\\_e15.files/2015fukusi\\_eigo\\_4.pdf](https://www.fukushihoken.metro.tokyo.lg.jp/joho/koho/publications/koho_bk/27/tokyo_fukuho_e15.files/2015fukusi_eigo_4.pdf).

<sup>206</sup> NAT'L. INST. OF INFECTIOUS DISEASES, *Dengue fever and dengue hemorrhagic fever* (Mar. 2015), <https://www.niid.go.jp/niid/en/865-iasr/5464-tpc421.html>.

<sup>207</sup> KANSENSHŌ NO YOBŌ OYOBI KANSENSHŌ NO KANJA NI TAISURU IRYŌ NI KANSURU HŌ [Act on the Prevention of Infectious Diseases and Medical Care for Patients with Infectious Diseases], Law no. 114 of 1998 (Japan).

Translation is available at:

<http://www.japaneselawtranslation.go.jp/law/detail/?id=2830&vm=04&re=02>.

<sup>208</sup> Hara and Shimada, *Recent Progress in Local Governmental Planning for Climate Change Adaptation in Japan: A Case of Climate Change Adaptation in Saitama Prefecture*, [http://www.airies.or.jp/ebook/Global\\_Environmental\\_Research\\_Vol.21.pdf](http://www.airies.or.jp/ebook/Global_Environmental_Research_Vol.21.pdf). See also Yasuaki Hijioka, Kazutaka Oka, et al. *Investigation of Existing Policies Contribution to promoting Climate Change Adaptation-A case study in Tokyo*, 67 J. JAPAN SOC. OF CIVIL ENGINEERS 6, 183- 192,

[https://www.jstage.jst.go.jp/article/jscej/67/6/67\\_6\\_II\\_183/\\_pdf](https://www.jstage.jst.go.jp/article/jscej/67/6/67_6_II_183/_pdf).

Unless scientific data for all of Japan are promulgated for each region, their certainty and accuracy might be lost, which might drive local governments' decision-making in the wrong direction. Several local governments can work together to share the expertise of research institutes or universities just as California works with other states. Local governments face a particular task: figuring out how to collect and share the data on climate change. Legal specialists are needed to achieve this goal.

The Tokyo metropolitan area has a sizeable financial power with which it promotes various adaptation projects. The uniqueness of Tokyo is that the price of land is high for a large population, the city's development happens rapidly, and energy consumption is high. Many houses and buildings are overcrowded even in the era of an aging society.

It would be ideal for local governments to monitor heat stroke patients regularly, but the local government has limited resources. The increasing number of senior citizens makes this task an issue for the national government.

Tokyo has a long history of being environmentally friendly. Today, climate change has impacted the probability of extreme climate risks. For example, floods occur beyond previous expectations. To counter these impacts, the Tokyo metropolitan area has implemented several measures such as installing several large water reservoirs underground to adapt to sudden downpours. Tokyo's metro has set rain shields at the ground entrances of its stations and provides the technology for residents to see data on flood vulnerable regions.

Tokyo has promoted technologically oriented adaptation projects, such as the ZEV. This project may be a model for other local governments. The Japanese constitution does not follow a federal system and does not have a commerce clause. This prevents issues of federalism, but there may be discrimination issues under the equality clause. The ZEV initiative is one of the leading climate change actions Tokyo's government is taking. It will subsidize individual customers and large businesses who want to use ZEVs.

Today, against the backdrop of affluence and financial resources, Tokyo supports several policies of adaptation. It might not be the best example for smaller cities. Nonetheless, its innovative ordinances show some failures and successes and have established Tokyo as a leading example for other local governments. Tokyo presents a model for other cities, whether or not they can undertake the same actions as it has.



