Title of Dataset: Controversial Facilities in Japan, 1955 - 1995

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Abstract:

The purpose of this study, Controversial Facilities in Japan, 1955 – 1995, is to understand the factors which lead decision-makers and authorities in Japan to select localities as host communities for often-unwanted and controversial facilities such as nuclear power plants, dams, and airports. Such projects regularly cause Not In My Back Yard, or NIMBY, responses from local residents around the world.

The dataset contains observations on approximately 500 Japanese cities, towns, and villages covering the period from 1955 through 1995. Data was collected through archival research, interviews with anti-facility activists and officials, and surveys of relevant government offices throughout Japan.

Variables assessed include the number of siting attempts and successes in the locality, the town's location in Japan by prefecture and by political district code alongside batteries of information on demographic, socioeconomic, and political factors. Demographic information includes sex ratios in the locality over time along with percentage of elderly in the population. Socioeconomic status was examined through measures of primary, secondary, and tertiary sector workforces over time along with variables on the coastal, mid-range, and deep sea fishing cooperatives (where applicable). Political variables include district magnitude, presence or absence of a prime minister from locally elected representatives, number of long-term Liberal Democratic Party (LDP) representatives, and the number of members of the town council and their political party. Additional political variables include the numbers and percentage of representatives from all major political parties in the national legislature, political party of the mayor, and measures of over-time support from the area for the long-dominant Liberal Democratic Party. The dataset contains publicly-available information on compensation provided to communities along with information on eminent domain use.

Keywords:

NIMBY, nuclear power, dam, airport, Japan, controversial facility, civil society, facility siting

Overview:

This dataset contains political, civil society, demographic, and controversial facility information through 275 variables on 472 Japanese localities over the period from 1955 to 1995. The unit of analysis is the politically defined city, village, or town which either was or was not a host for a nuclear power plant, dam, or airport. This dataset is designed to investigate questions of site selection and siting success for often unwanted projects in Japan.

The data set contains only localities which meet the geographical and geological criteria for siting such facilities, such as land which is both impermeable to water and resistant to seismic shocks. A full or even random sample of some of the 3000 villages and towns across Japan would not provide much insight into the problem, as we do not find nuclear power plants located in downtown Tokyo or Osaka, nor do we find airports on the tops of mountains. I filtered cases through a matching process to isolate the signal from noise using GIS (Geographic Information System) data to exclude sites on which administrators would not construct facilities because of loose soil, distance from water supplies, or other geographic factors.

Sampling methods:

I used an equal-shares, choice based sampling method (see King and Zeng 2001a; King and Zeng 2001b; King et. al. 1994 Sect 4.4.2) using politically defined localities (towns, cities, and villages) as the unit of analysis to generate 472 observations. I deliberately selected observations to include the entire universe of facility host communities in which state agencies played a major role. By collecting observations where siting attempts for a nuclear plant, dam, or airport occurred (but may or may not have been completed), along with carefully matched observations where no controversial facility was proposed but which still shared the same geographic, geologic, and temporal characteristics, I achieved greater analytical power with fewer total observations.

The observations in my dataset where Y=1 constitute the entire universe of attempted siting cases of nuclear power plants and airports in which the Japanese central government acted as an entrepreneur or founder of the project, and half of the dam cases where the state played a similar role (dam cases were selected at random). I chose airport, dam, and nuclear power plant siting attempts because the Japanese and other national governments regularly face resistance when attempting to build these large scale facilities. The balance of observations where Y=0 (where no siting was attempted) and Y=1 (where the government sought to locate a facility in the locality) within the dataset was approximately equal ($\hat{Y}$ = .494), hence the label “equal shares.”

I matched the set of cases where authorities attempted siting against those where no siting had occurred temporally, geographically and geologically Analysts who build observational datasets without ensuring that their cases involve "apples and apples," as opposed to dissimilar subject samples, do so at their peril. In matching the observations where Y= 0, I followed the explicit decision heuristics of siting authorities according to both interviews and archival records. To assist me in selecting cases where no siting attempt had occurred I relied upon both geographic information systems (GIS) data and extensively detailed geological and geographical maps of Japan. Accordingly, areas where nuclear powers plants could potentially be sited met four geologic, geographic, and demographic criteria: 1) solid bedrock (and not alluvial plain), to ensure aseismicity, 2) distance from large population centers such as Osaka and Tokyo, 3) proximity to water, so that cooling towers could draw in seawater to dissipate heat from the nuclear reactors, and 4) relatively low population density, to ensure the evacuation plans would be feasible.

I excluded a number of landlocked prefectures from the nuclear power plant potential sample subgroup of the Y=0 set because of their lack of access to seawater (Tochigi, Gunma, Saitama, Yamanashi, Nagano, Gifu, Nara). I excluded others because of ground quality (Toyama), and an additional one because of the need for evacuation plans (Tokyo). Potential host communities for dams and similar water projects (river gates, rerouting, etc.) required bodies of water, and, when possible, bodies of water which extended across prefectural boundaries as the central government is most likely to build dams on "first grade" rivers which do so. Thus I excluded Fukuoka and Nagasaki prefectures from possible dam locations. Airports required proximity to large urban centers along with suitable geographic conditions (no whole prefectures were excluded from the possible airport siting location subset). These balancing cases also matched the Y=1 cases in terms of time; observations match on both spatial and temporal axes so that each case of an actual siting attempt in 19XX is balanced by a non event in 19XX which has the same suitability for a controversial project.

Weighting:

There are two main methods for correcting estimates when one selects on the dependent variables: 1) prior correction and 2) weighting. Such additional techniques must be employed to "compensate for differences in the sample ($\hat{y}$) and population (τ) fraction of ones induced by choice based sampling" (King and Zeng 2001a: 144). While the dataset contained a ratio of Y=1 to Y= 0 of 1:1, the actual population of cases is closer, in nuclear power plants, for example, to 1:600, while in dams it is closer to 1:888 and 1:144 in airports. That is to say, when a nuclear power plant was sited in year 19XX, there were 600 other localities with the same suitable geographic and geologic criteria which were not selected. I calculated the population of ones to zeros in the actual population, i.e., the fraction of localities in Japan which met the geographic and geologic using GIS data and existing geographic and geological maps, for each type of facility. Those estimations allow me to re-weight the dataset to create a population roughly equivalent to that found in the field. Because prior corrections requires proper model specification, it is slightly disadvantageous when compared to weighting (Xie and Manski 1989).

Technical Information about the Files:

The dataset has 472 observations across 275 variables. The codebook accompanying this documentation has full descriptions of each of the variables, including information on its source, formulas used to calculate its value, the number of recorded observations, its mean, standard deviation, along with minimum and maximum values.

Funding sources:

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Data sources

Political Data

Steven Reed, *Shūgiin Giin Sōsenkyo Kōhoshabetsu Tokuhyō Kekka* 1947 – 1995 [Japan Election Data, House of Representatives, 1947 – 1995], Takayoshi Miyagawa, *Shō senkyoku Handobukku* [Handbook of Single Member Constituencies] (Tokyo: *Seiji Kōhō Sentā* [Center for Political Public Relations], 1996), and direct surveys of mayoral offices, gubernatorial offices, and fishing cooperatives (carried out by the author, June 2002 – September 2003).

Facility Data

Direct surveys of local ministerial offices and controversial facility siting authorities (by the author June 2001 – September 2001 and June 2002 – September 2003), *Genshiryoku shiryō jōhō shitsu* [Citizens' Nuclear Information Center, CNIC], *Genshiryoku shimin nenkan 2002* [Citizen's yearbook on nuclear energy] (Tokyo: CNIC, 2002), *Hangenpatsu Undō Zenkoku Renraku kai* [National Anti-Nuclear Liaison Group], *Hangenpatsu Shinbun* [Anti-Nuclear Newspaper]. (Tokyo: *Hangenpatsu Undō Zenkoku Renraku kai* 1978 – 1998), *Asahi Shinbun* [Asahi Newspaper], *Asahi Shinbun Sengo Midashi Sakuin* [Asahi Newspaper Headline Database 1945 – 1995] (Tokyo: Asahi Shinbun), *Nihon Damu Kyōkai* [Japan Dam Federation], *Damu Nenkan* [Dam Yearbook] (Tokyo: *Nihon Damu Kyōkai*, various years), and from http://www.mlit.go.jp/koku/04_outline/01_kuko/01_haichi/index.html.

Demographic Data

Tōyō Keizai Shinpōsha, Jinkō tōkei sōran: kokusei chōsa shūtaisei [Population Statistics of Japan: Summary of National Censuses and other Surveys, 1872 – 1984] (Tokyo: *Tōyō Keizai Shinpōsha, 1985*), *Sōmuchō Tōkeikyoku* [Statistics Bureau, Home Affairs Ministry], *Nihon no Jinkō: Heisei Ninen Kokuseichōsa Saishūhōkokusho* [Population of Japan: Final Report of the 1990 Population census] (*Tokyo*: Sōmuchō Tōkeikyoku, 1995), *Sōmuchō Tōkeikyoku* [Statistics Bureau, Home Affairs Ministry], *Nihon no Jinkō: Heisei Nananen Kokuseichōsa Saishūhōkokusho* [Population of Japan: Final Report of the 1995 Population census] (Tokyo: *Sōmuchō Tōkeikyoku*, 2000), *Sōmuchō Tōkeikyoku* [Statistics Bureau, Ministry of Home Affairs], *Heisei Jūninen Kokuseichōsa Saishūhōkokusho Jinkōsōsū, Dai ichi maki* [Total Population: 2000 Population Census of Japan, Volume 1] (*Tokyo*: *Sōmuchō Tōkeikyoku* 2002)

Geologic and Geographic Data

Nihon Daiyonki Gakkai hen [Japan Association for Quaternary Research], ed. *Nihon Daiyonki chizu* [Quaternary Maps of Japan]. (Tokyo: Tōkyō Daigaku Shuppankai, 1987), International Society for Educational Information, *Atlas of Japan: Physical, Economic, and Social* (Tokyo: International Society for Educational Information, 1970), and electronic GIS databases available at http://www.cast.uark.edu/jpgis/.

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King, Gary, Zeng, Lanche. (2001a). Logistic Regression in Rare Events Data. Political Analysis.

King, Gary, and Zeng, Langche. (2001b). Explaining Rare Events in International Relations. International Organization 55:3 Summer 2001 pp. 693 - 715.

King, Gary, Keohane, Robert, and Verba, Sidney. (1994). Designing Social Inquiry: Scientific Inference in Qualitative Research. Princeton: Princeton University Press.

Xie, Yu and Manski, Charles. (1989). The Logit Model and Response-Based Samples. Sociological Methods and Research 17:283-302.

Studies, Articles, Working Papers, and other Publications Using this Dataset:

Aldrich, Daniel P. (2005). *Leviathan or Agile State? Strategies and Tool Kits for Siting Public Bads*. Unpublished doctoral dissertation for the Department of Government at Harvard University.

Aldrich, Daniel P. (forthcoming). *Site Fights: Handling Controversial Facilities in Japan and the West.* Ithaca and London: Cornell University Press.

Aldrich, Daniel P. (forthcoming). Location, Location, Location: Selecting Sites for Controversial Facilities. *Singapore Economic Review*.