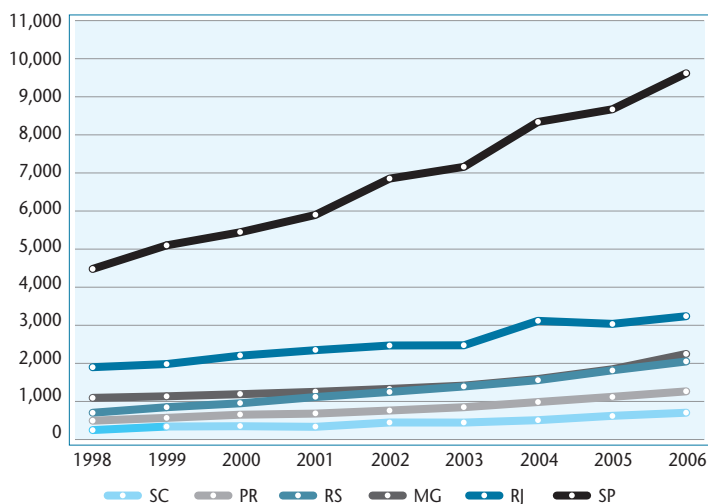


Highlights of Chapter 4 – Scientific Production in São Paulo State

- Brazil's contribution to world scientific production indexed by the SCIE and SSCI databases, rose from 1.6% in 2002 to 1.9% in 2006. The number of Brazilian publications grew 43.5% from 13,180 to 18,915 in the period, far outpacing world growth, which was 22.7%.
- A regional breakdown of Brazilian scientific output indexed by SCIE and SSCI in the period 2002-06 shows the Southeast in the lead, with 74.5% of the total, followed by the South (19.0%), Northeast (12.2%), Centre-West (5.4%) and North (2.7%).
- The leading institutions in terms of scientific output in the period 2002-06 were as follows, with their respective contributions to the Brazilian total: USP (25.5%), Unicamp (10.1%), UFRJ (8.7%), Unesp (7.3%), UFRGS (5.8%), UFMG (5.2%), Unifesp (4.0%), Fiocruz (3.1%), and UFSCar (3.0%).
- São Paulo State's share of total Brazilian scientific output indexed by SCIE and SSCI in the period 2002-06 was 51.0%, slightly larger than in the period 1998-2002 (49.9%).

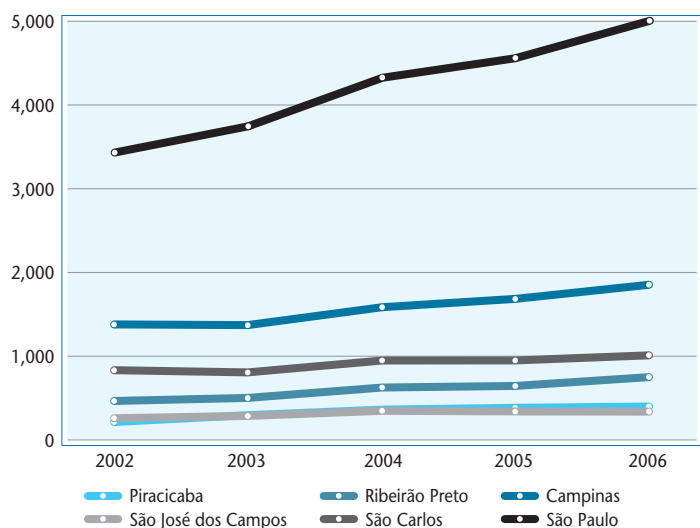
São Paulo State & selected states of Brazil: Scientific publications indexed by SCIE & SSCI, 1998-2006



Source: Thomson Reuters (2008), SCIE & SSCI via Web of Science.

- São Paulo State's contribution to world scientific output rose from 0.81% in 2002 to 0.94% in 2006.

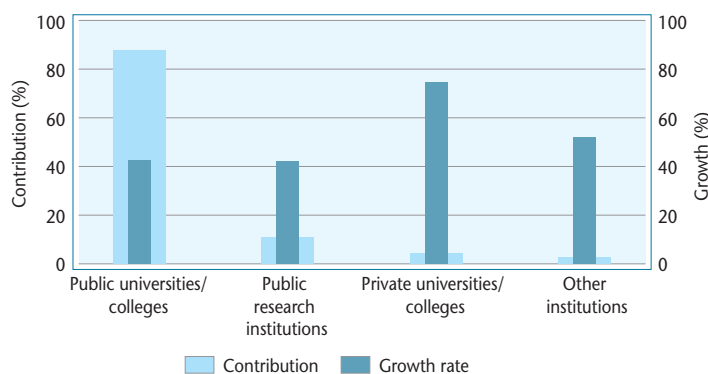
São Paulo State: Scientific publications indexed by SCIE & SSCI, selected cities, 2002-06



Source: Thomson Reuters (2008), SCIE & SSCI via Web of Science.

- Growth in São Paulo State's share of Brazilian and world scientific output was driven by a 41.4% rise in the state's scientific output in 2006 compared with 2002.
- The city of São Paulo contributed 51.8% of São Paulo State's scientific output indexed by SCIE and SSCI in the period 2002-06, while the rest of the state contributed 54.7% (these shares add up to more than 100% because of co-authorship), reflecting decentralisation and the dynamism of the state interior, largely thanks to successful public policies.
- Public universities and research institutions accounted respectively for 87.7% and 10.8% of São Paulo State's scientific production in the period 2002-06.
- Private universities contributed relatively little (4.4%) to the state's production. Nevertheless, their share of the state total rose 74.8%, far outpacing other types of institution in the state. This reflects the influence of policies introduced to improve the quality of research in these institutions, as well as collaboration with public universities and institutions.

São Paulo State: Institutional contributions to scientific publications indexed by SCIE & SSCI and growth rates, by type of institution, 2002-06 (cumulative)



Source: Thomson Reuters (2008), SCIE & SSCI via Web of Science.

- USP was the leading university in Brazil and São Paulo State in terms of scientific output indexed by SCIE and SSCI, with 3,297 publications in 2002 and 4,830 in 2006, for growth of 46.5%. Its contributions to production in the state and Brazil in the period 2002-06 were 50.0% and 25.5% respectively.
- Unicamp's output rose 41.0% in the same period from 1,364 to 1,923 publications, contributing 19.8% to the state's production, while Unesp's rose 44.7% from 982 to 1,421 publications, contributing 14.4%.
- Unifesp's output rose 57.8% from 510 publications in 2002 to 805 publications in 2006, while UFSCar's output rose 10.5% from 446 to 493.
- All the public universities mentioned were among the ten institutions that most contributed to scientific production in São Paulo State and Brazil in terms of SCIE- and SSCI-indexed publications.
- The leading research institution in the period in terms of scientific output was INPE, the National Space Research Institute, with 17.1% growth from 193 publications in 2002 to 226 in 2006, and contributing 2.7%.
- CTA and Instituto Butantan each contributed 1.4% to São Paulo State's scientific publications in the period 2002-06.
- The highest growth rates were achieved by Instituto Butantan (81.8%) and the institutes subordinated to Apta, the São Paulo State Agribusiness Technology Agency, among others.
- Broken down by knowledge area, São Paulo State's scientific output

in the period 2002-06 was led by medicine, physics, chemistry, botany and zoology, biology and biochemistry, and engineering.

- In medicine, which accounted for the largest proportion of scientific output in the period 2002-06 both in Brazil and in São Paulo State, 61.5% of publications originating in Brazil came from São Paulo State, up from 57.7% in the period 1998-2002.
- The leading knowledge areas in USP's scientific output were medicine (20%), physics (13%), chemistry (12%), botany and zoology (8%), and biology and biochemistry (7%).
- The leading knowledge areas in Unesp's scientific output were botany and zoology (21%), physics (16%), medicine (11%), chemistry (10%), and biology and biochemistry (7%).
- The leading knowledge areas in Unicamp's scientific output were chemistry (18%), medicine (18%), physics (14%), engineering (8%), and biology and biochemistry (7%).
- In international collaboration, collaboration with the United States predominated, with 40% of the total.
- Collaboration between São Paulo State and China was relatively small (3.1%) despite the significant volume of Chinese scientific production, but China was, among the countries that publish more, the one with which the collaboration showed the highest growth (107%).
- Growth in collaboration between São Paulo State and most countries was stronger than with other parts of Brazil. The highest growth rates were in collaboration with South Korea (313.3%), India (184.8%), Mexico (126.8%), Argentina (82.8%), Australia (77.6%), Spain (58.3%), United Kingdom (51.9%), and United States (38.4%).
- With regard to collaboration between researchers in São Paulo State and other states of Brazil, Rio de Janeiro remained the leader with 20.7%, followed by Minas Gerais (17.5%), Paraná (14.9%), Rio Grande do Sul (12.8%), and Pernambuco (8.0%).
- Growth was significant (over 100%) in collaboration between São Paulo State and Minas Gerais, Espírito Santo, Pernambuco, Ceará, Piauí, Alagoas, Goiás, Mato Grosso do Sul, Mato Grosso, Pará, Amazonas and Rondônia.
- The SciELO database indexed 60,204 publications in the period 2002-06, reflecting 78.9% growth in 2006 compared with 2002.
- Brazil's contribution was 77.3% and São Paulo State's was 32.5% in the period 1998-2002, followed by much faster growth by the former than the latter in the period 2002-06, when their respective contributions reached 73.6% and 26.2%.
- In the field of global climate change, 12.1% of publications in the period 1998-2007 came from developing countries, with Latin America and the Caribbean accounting for 2.5% and about half of these (1.2%) coming from Brazilian institutions.
 - About 61% of articles on this subject co-authored with Brazilian institutions involved institutions in São Paulo State, corresponding to 0.8% of the world total.
 - Brazilian institutions featured in 0.64% of publications indexed in the period 1998-2002 (8 out of 1,248) and 1.53% in the period 2003-07 (38 out of 2,481).
- Brazilian scientific production in sugarcane genomics increased significantly after publication of data from FAPESP's Sucest Programme in 2001, reaching 20% of world publications on average in the period 1998-2006.
 - Networked research in sugarcane genomics and genetic improvement in São Paulo State contributed a significant proportion, with 17 institutions contributing 58% of publications in the period; USP led this effort in terms of the number of publications (47 out of 139 articles published by Brazil), followed by Unicamp.
 - In this network, collaboration was particularly intense among USP, Unicamp, UFSCar, Unesp and Centro de Tecnologia Canavieira (CTC).
 - It is also important to note the contributions of UFRJ and Embrapa to the formation of a national network, thanks to their substantial scientific output and collaboration with institutions in São Paulo State and other parts of Brazil.
 - The Sucest-FUN research network's achievements include identification of genes that regulate sucrose content and genes associated with stress response. Members of the Sucest-FUN Project recently linked up with federal universities associated with the Sugarcane Breeding Program (PMGCA) of the Inter-University Network for the Development of the Sugar & Ethanol Industry (RIDESA) and Instituto Agrônomo de Campinas (IAC).
 - The genomics group has expanded and now participates in the FAPESP Bioenergy Research Program (BIOEN), which includes researchers at 20 universities and research institutions in Brazil and 17 in other countries (see <http://bioenfapesp.org>).