
Development in Odisha

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The Index

Odisha is one of India's poorest states, having suffered from slow economic development for an extended period since independence. It is primarily agrarian and is historically prone to natural disasters such as droughts and floods, creating a serious threat to food security. Poor infrastructure, government apathy, and a lack of entrepreneurship helped contribute to Odisha's slow industrialization over the years. In terms of socio-economic development, basic literacy remains a primary concern – in 2011, more than a quarter of the population could not read, and no district has a literacy rate higher than 90%. According to Pratham, school and teacher quality in Odisha is alarmingly low, and some districts suffer from gaping differentials between male and female literacy. Women lag in labor force participation and school enrollment as well, and a high population of Scheduled Tribe members implies a needed focus on the empowerment of these marginalized groups. An enormous amount of households lack basic amenities, such as a main source of drinking water within their premises. Health indicators, despite recent improvements, still lag behind All-India levels.

Overall, there is serious room for improvement. However, analyzing performance at a state level forgoes understanding for convenience – at a district level there exist wide disparities in socio-economic indicators. Even within a district, indicators vary immensely, as districts were often quite successful in one aspect of development, but not in others. This index hopes to capture the wide heterogeneity of development component outcomes across Odisha's districts, while focusing on aspects of development more prevalent to the state, such as food security, marginalized individuals and education. In the spirit of Amartya Sen, this index seeks to capture the various dimensions of development outside of income – with a focus on those that improve individual capabilities.

Marginalized Groups

The capabilities of women and Scheduled Tribes (ST) were the focus of this component, with a 2/3 weighting of women's issues and a 1/3 weight to ST issues. The principal role of women in development is well-documented, given their tendency to invest more in their children's education and health, never mind the enhanced productivity a region stands to gain by simply including women. Reduced child marriage and enhanced family planning both contribute to a woman's agency, while educational deficits and workforce participation are important indicators of the standing of women in society as a whole. ST considerations are also paramount in the case of Odisha, as they are often some of the most marginalized individuals. Their participation in early education is a prerequisite for further socio-economic opportunity.

Women's Issues

- Currently married women under 18 years of age, 2012-13 (%)
- Current use of any modern method of family planning, 2012-13 (%)
- Female labor force participation (15 and above), 2012-13 (%)
- Gap in literacy between men and women, 2011
- Secondary School Net Enrollment Ratio (NER) of women, 2013-14 (%)

ST Issues

- Primary School ST Enrollment, 2013-14 (%)

Food Security

As mentioned earlier, Odisha's agrarian nature and history of natural disasters make food security a necessary aspect of development. Food is a basic need, the absence of which creates a serious constraint on individual capabilities, and is largely influenced by agricultural productivity. This component is comprised of fertilizer use and a proxy for overall (staple) crop yield, weighted at 1/3 and 2/3 respectively.

- Fertilizer Consumption, 2013-14 (Kg/Ha)
- Total Cereal Yield, 2013-14 (Kg/Ha)

Basic Amenities

Household amenities are an essential indicator of an individual's most basic needs – electricity, for example, is a requirement for modern economic activity. Toilet prevalence, rural mobile phone use, electrified villages, and households with electricity as their primary power source were weighted at $1/6$ each. Toilets are a central issue in India's development, and have important health implications. Rural mobile use is a good proxy for rural telecommunication infrastructure, while electrified villages and households with primary electricity were included to separately account for achievements in overall electrification and the predominance of electricity within individual homes. The remaining $1/3$ weight was split between rural ($2/3$) and urban ($1/3$) measures of water access within household premises.

- Rural households with a mobile phone, 2011 (%)
- Villages electrified, 2013-14 (%)
- Households with a toilet, 2011 (%)
- Households with electricity as main source of lighting, 2011 (%)
- Rural households with main source of drinking water within premises, 2011 (%)
- Urban households with main source of drinking water within premises, 2011 (%)

Education

In terms of economics, education is a vital component of human capital development. But its benefits are perhaps most felt in the social aspects of development, as educational achievement greatly increases not just economic opportunity, but overall quality of life as well. Alongside enrollment, this component attempts to target school quality with proxies such as the percentage of qualified teachers and the pupil-teacher ratio. Each item is given a $1/5$ weight.

- Primary School NER Total, 2013-14 (%)
- Secondary School NER Total, 2013-14 (%)
- Schools with drinking water facility, 2013-14 (%)
- Pupil-teacher ratio, 2013-14 (%)
- Primary School teachers with Secondary Education per capita, 2013-14

Health

Health is another fundamental human need, and has significant capability and quality of life ramifications. Poor health directly harms both productivity and happiness, and an unhealthy population is unlikely to contribute to further development. Health sub-center quantities were included as a proxy for medical accessibility. Infant mortality rate and childhood immunization rates are used as an indicator of the population's overall health, given the lasting positive repercussions of early immunization as well as the effect that a parent's health has on the likelihood of a child dying at infancy. Each item was weighted 1/3.

- Infant Mortality Rate per 1,000, live births 2012-13
- Health sub-centers per capita, 2012-13
- Children aged 12-23 months fully immunized, 2012-13 (%)

Financial Capability

Financial infrastructure and capability are less urgent, but nonetheless key dimensions of development. Outside of income, a variety of factors interact with an individual's economic opportunity, including inequality, access to credit, and access to steady work. Additionally, entrepreneurship, something Odisha has struggled with relative to the rest of India, has substantial connotations for development after basic needs are met. In this component, a 1/3 weight was given to Net District Domestic Product (NDDP) and a 2/15 weight was given to rural inequality, urban inequality, bank branch quantity, micro, small and medium enterprises (MSMEs), and the proportion of marginal workers, or those who worked for less than six months.

- Per capita NDDP 2010-11 at Current Prices (₹)
- Rural Lorenz Ratio, 2012
- Urban Lorenz Ratio, 2012
- Bank branches per capita, 2013-14
- MSMEs set up per capita, 2013-14
- Marginal workers to total workers, 2014-15 (%)

Results

Each of the six development components was weighted equally to create the composite index. Overall, there exists significant variation in development across districts and components in Odisha. It was often impossible to predict district success in one component based on their outcome in another dimension of development. Some districts, like Nawarangpur, had a relatively high overall ranking, and enjoyed higher scores in aspects like food security and the empowerment of marginal groups, but was fourth from last in the basic amenities category. However, the leading composite score (a moderate 0.55) from the Balangir district reflects the lack of dominance of any one state across all indicators. For reference, the lowest score, from the Nayagarh district, was a nigh 0.33. Nonetheless, the full rankings are as follows:

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|-------------------------------|----------------------------------|
| 1. Balangir [0.551] | 16. Rayagada [0.452] |
| 2. Keonjhar [0.548] | 17. Angul [0.451] |
| 3. Sambalpur [0.533] | 18. Khurda [0.448] |
| 4. Sundargarh [0.526] | 19. Sonepur [0.444] |
| 5. Mayurbhanj [0.524] | 20. Jajpur [0.444] |
| 6. Bhadrak [0.505] | 21. Jagatsinghpur [0.441] |
| 7. Jharsuguda [0.502] | 22. Nuapara [0.440] |
| 8. Nawarangpur [0.502] | 23. Kendrapara [0.436] |
| 9. Balasore [0.488] | 24. Koraput [0.420] |
| 10. Bagarh [0.485] | 25. Cuttack [0.414] |
| 11. Kandhamal [0.480] | 26. Malkangiri [0.405] |
| 12. Dhenkanal [0.475] | 27. Puri [0.394] |
| 13. Kalahandi [0.472] | 28. Ganjam [0.371] |
| 14. Deogarh [0.470] | 29. Boudh [0.366] |
| 15. Gajapati [0.465] | 30. Nayagarh [0.328] |

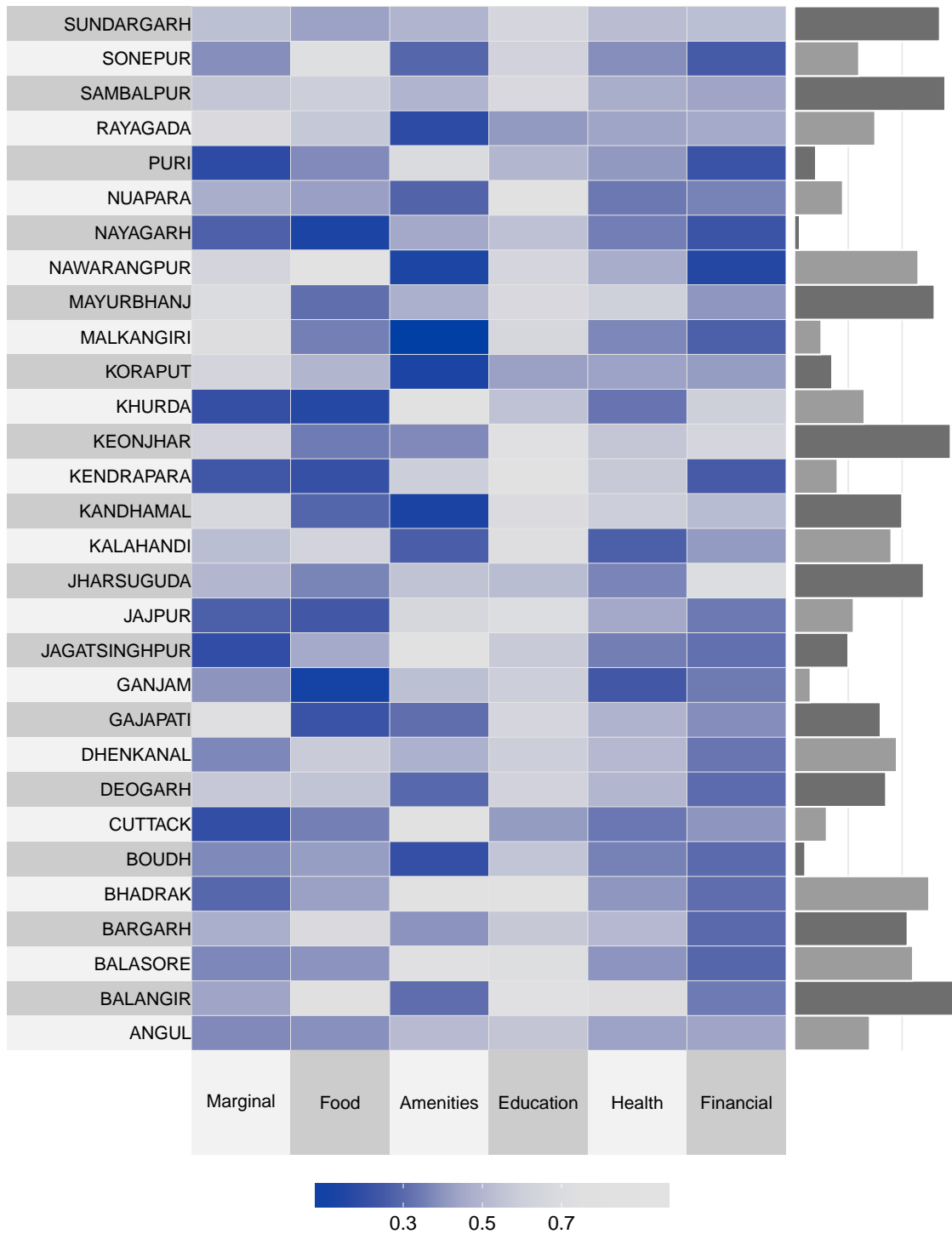


Figure 1: Heat Map of Each Index Component incl. Bar Chart of Overall Rank

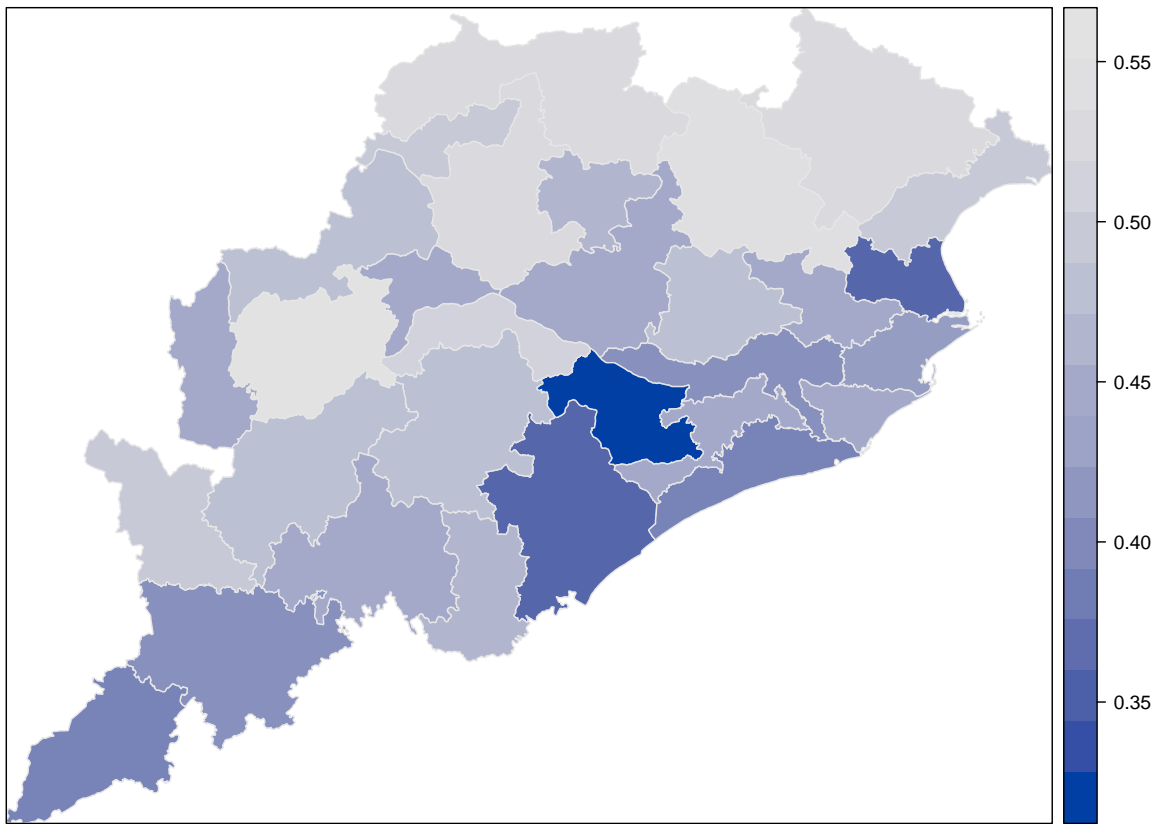


Figure 2: District-wise Composite Index

	Marginal	Food	Amenities	Education	Health	Financial	Composite
ANGUL	0.37	0.39	0.52	0.55	0.43	0.44	0.45
BALANGIR	0.44	0.75	0.31	0.76	0.72	0.34	0.55
BALASORE	0.37	0.40	0.76	0.72	0.40	0.29	0.49
BARGARH	0.47	0.67	0.40	0.56	0.51	0.30	0.48
BHADRAK	0.29	0.42	0.78	0.82	0.40	0.31	0.50
BOUDH	0.37	0.41	0.20	0.55	0.36	0.30	0.37
CUTTACK	0.20	0.35	0.79	0.41	0.33	0.40	0.41
DEOGARH	0.56	0.55	0.30	0.62	0.50	0.30	0.47
DHENKANAL	0.37	0.58	0.47	0.59	0.51	0.33	0.48
GAJAPATI	0.75	0.22	0.31	0.64	0.48	0.38	0.46
GANJAM	0.40	0.11	0.53	0.60	0.24	0.34	0.37
JAGATSINGHPUR	0.19	0.45	0.76	0.57	0.35	0.32	0.44
JAJPUR	0.27	0.24	0.65	0.71	0.45	0.34	0.44
JHARSUGUDA	0.50	0.36	0.55	0.53	0.36	0.71	0.50
KALAHANDI	0.53	0.63	0.27	0.73	0.27	0.41	0.47
KANDHAMAL	0.66	0.29	0.12	0.69	0.59	0.53	0.48
KENDRAPARA	0.24	0.21	0.59	0.76	0.57	0.25	0.44
KEONJHAR	0.62	0.35	0.37	0.75	0.56	0.64	0.55
KHURDA	0.20	0.17	0.85	0.54	0.33	0.60	0.45
KORAPUT	0.63	0.49	0.13	0.42	0.43	0.41	0.42
MALKANGIRI	0.71	0.35	0.06	0.65	0.37	0.27	0.40
MAYURBHANJ	0.70	0.31	0.47	0.66	0.61	0.40	0.52
NAWARANGPUR	0.64	0.96	0.14	0.65	0.46	0.17	0.50
NAYAGARH	0.28	0.13	0.45	0.54	0.35	0.22	0.33
NUAPARA	0.46	0.42	0.28	0.77	0.34	0.36	0.44
PURI	0.18	0.38	0.69	0.49	0.41	0.22	0.39
RAYAGADA	0.67	0.56	0.18	0.41	0.43	0.45	0.45
SAMBALPUR	0.56	0.59	0.49	0.66	0.46	0.43	0.53
SONEPUR	0.39	0.73	0.29	0.62	0.39	0.25	0.44
SUNDARGARH	0.53	0.42	0.49	0.65	0.53	0.53	0.53

Observations

As is often the case with developing countries, India suffers from some serious data quality issues, and some of the statistics may not be reliable. For example, enrollment figures are commonly inflated by teachers. Variables included are also quite likely to be imperfect measures of the factors they attempt to capture. Statistics such as bank branches or health sub-centers per capita disguise the tendency of spatial agglomeration inherent to economic growth. Tenancy rights and issues of landlessness are central to Odisha's development story, yet creating an impartial indicator is out of the scope of this paper. Environmental degradation would have been an advantageous aspect given the issues of deforestation in Odisha, but a lack of robust data precludes analysis. All in all, while the index attempted to clarify district-wise socio-economic disparities, any form of aggregate data risks disguising serious failings in some dimensions.

The process of compiling sub-indices quite possibly attenuated informative variation in development aspects, particularly in education – indeed, disparities in many of the variables were masked when compiling each item into a component. Issues aside, this index tackled an array of development considerations, and benefited from a rich variety of data sources, despite the relatively clustered composite index scores. It could be the case that Odisha’s districts simply suffer from varying low levels of development, so perhaps this lack of differentiation echoes the distinct shortcomings of each district.