



The economy of the Indian Bengal delta

Highlights/Summary

- The trade and transport and fishing sectors are relatively much bigger in the Indian Bengal delta than in the rest of the country (31.9% vs 22.9% in the former and 4.1% vs. 0.8% in the latter).
- The work of females satisfies directly and indirectly more the final demand abroad (both in the non-delta and in the RoW)-probably because of the role of women in export-oriented activities.
- Agricultural land use is clearly dominated by paddy rice (above 800,000 hectares), these changes enormously when considering the embodied agriculture land in the final demand of goods and services.
- The delta is net exporter of employment but net importer of energy and CO2 emissions.

Introduction

The aim was to gather some insights on the Mahanadi delta on socioeconomic and biophysical context, in terms of their relations and interdependencies through the supply chain up to the final demand of goods and services at three scales: in the delta, in the country and in the Rest of the World (RoW).

We had three major objectives:

- To investigate the Distribution of Value Added in the Delta and non-Delta.
- To investigate the labour and gender embodiments in the final consumption of goods and services, both within the country (delta and non-Delta) and in the RoW.
- To examine other environmental implications, such as the land and environmental embodiments and footprints.



Figure 1: Location map of the Indian Bengal delta

Geographical context

The Indian Bengal Delta (IBD) (marked in a box in the map) comprises the Indian part of the transboundary Ganges-Brahmaputra-Meghna megadelta and marks where they Hooghly river and its tributaries meet the Bay of Bengal. It covers an area of 14,054 km² and comprises two districts: North 24 Parganas and South 24 Parganas).

According to the Census 2011, the decadal growth rates of North 24 Parganas and South 24 Parganas are 12.04 percent and 18.17 percent, respectively-the latter of which exceeds the growth rate of West Bengal state. Sex ratios in both the districts are almost identical (955

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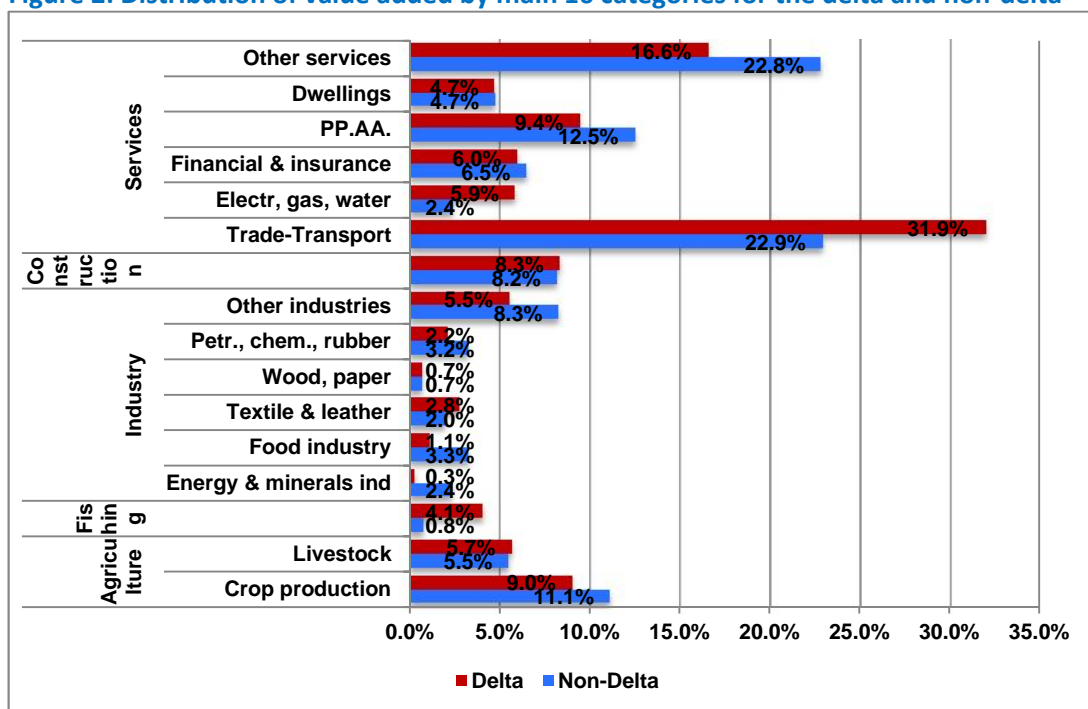
females per 1000 males), and are higher than the state-level figures of 950 per 1000 males in West Bengal.

1. Distribution of value added in the delta and non-delta

The general approach taken for this study is an environmentally (the socioeconomics are already there) extended input-output model. This allows studying elements such as the labour, gender, land, environmental embodiments and footprints.

Figure 2 shows the shares of value added (VA) of the main, respectively, 6 and 16 categories of sectors (from the aggregation of the 57 of GTAP 9). Figure 2 shows the shares of value added (VA) of the 6 major sectors (services, trade and transport, construction, industry, fishing, agriculture) and 16 categories of sectors (through aggregation from the 57 items of GTAP, version 9). Figure 2 shows the high importance of the agriculture sector, notably the fishing sector, which is relatively much bigger in the delta than in the rest of the country (4.1% vs. 0.8%). Also the trade and transport activities and the services sectors and, to a lesser extent, the construction sector are relatively more important in the delta than in the rest of the country (non-delta). On the other hand, the employment in the services of public administrations, financial and insurance, in crop production and in some other industries, is higher in the rest of the country than in the delta. These results indicate the relative economic underdevelopment of this delta.

Figure 2: Distribution of value added by main 16 categories for the delta and non-delta



2. Labour and gender embodiments

Figure 3 shows the distribution by sector of employment of the delta. The main result of employment in the delta is the satisfaction of the final demand within the delta itself (2.343 million people, around 40%), notably in services (1.096 million people), agriculture and forestry (665K people), and manufacturing and mining (266,000 people). In the case of services, a non-trivial number of workers (144K people) satisfy the final demand in the Rest of the World. Manufacturing and mining (365K people) satisfy the final demand in the non-delta, while fishing (159K people) dominates employment to satisfy the final demand of the delta itself of 84K people) and energy satisfies the final demand of the delta itself of 16K people.

Figure 3: Employment of the delta by demanding region and sector

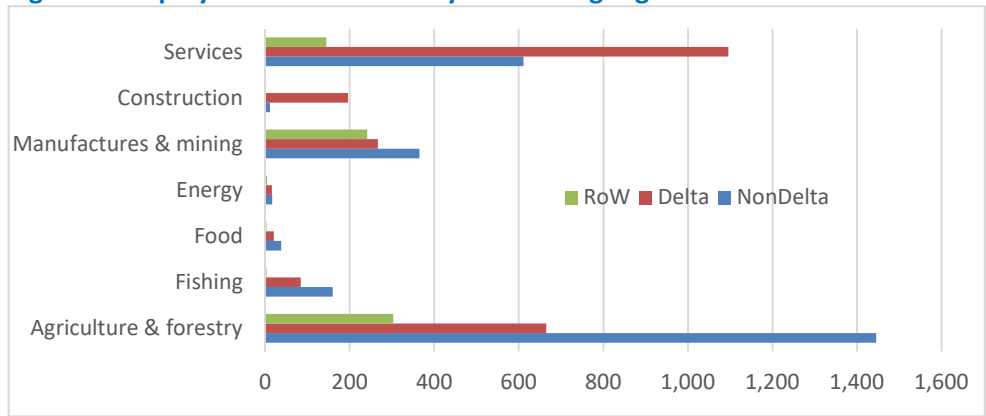


Figure 4: Direct and embodied labour of the delta by sector

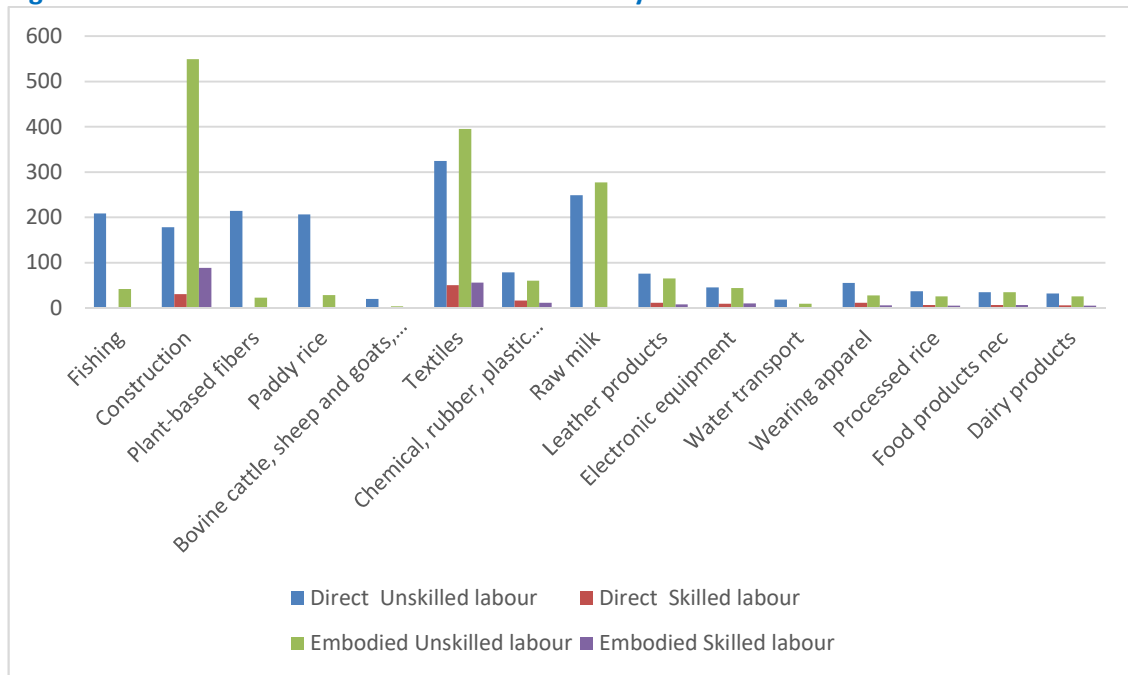


Figure 5: Direct and embodied labour by sector and gender in the non-delta and delta

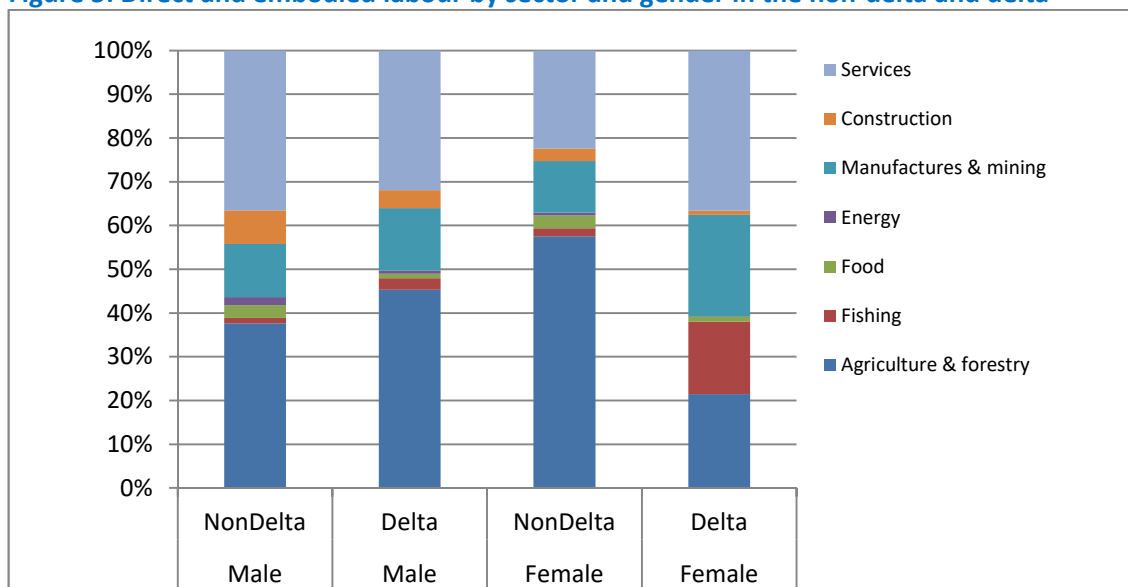


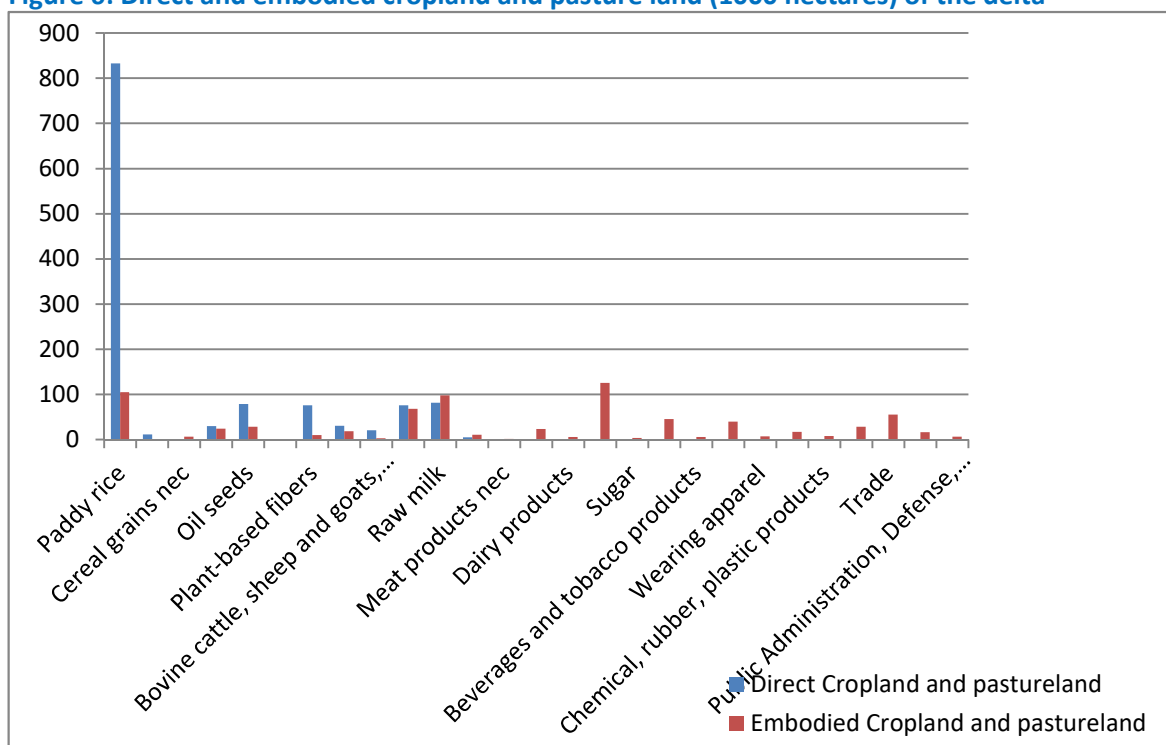
Figure 4 extends the insights obtained in Figure 3, with a sectoral and skill type detail (according to GTAP classification). In particular, the directly and indirectly embodied employment is important in construction, mostly unskilled, and the textile and raw milk sectors. The fishing sector, mostly occurring to satisfy the (exports) final demand of the non-delta (also partly the RoW). Plant-based fibres and paddy rice embody less employment in their final goods sold to final demand (although they have important direct employment levels).

Figure 5 extends the insights by providing the gender detail of this employment. The work of females satisfies directly and indirectly more the final demand abroad (both in the non-delta and in the RoW) than the work of males. This is probably because in this delta the work of female is normally used in activities that are typically assigned to women (like collection of prawn seeds) and the resulting output are mostly export oriented intermediate inputs. The embodied work of women in the delta mostly is mainly in the services, manufacturing and fishing, while being relatively less important in agriculture, energy and construction sectors.

4. Land and environmental embodiments and footprints

The environmental extensions allow for the computation of many embodiments and footprints, illustrated here for the case of land use, in Figure 6. The direct agricultural land use is clearly dominated by paddy rice (above 800,000 hectares), but this changes enormously when considering the embodied agriculture land in the final demand of goods and services. In particular, the embodied land use in the raw milk is particularly relevant, mostly occurring to satisfy the (exports) final demand of the non-delta (also partly the RoW). Sectors not directly using agricultural land the most, such as food industry sectors and textile, have notable embodied (directly and indirectly) agricultural land levels.

Figure 6: Direct and embodied cropland and pasture land (1000 hectares) of the delta



Implications and recommendations

Employment is higher in the rest of the country than the delta in the services of public administrations, financial and insurance, in crop production and in some other industries, implying relative economic underdevelopment of the delta region.

In the non-delta, the construction sector has more share of employment than in the delta, and interestingly, less in agriculture (when the share of value added is relatively higher). So it may be said that that infrastructural developmental activities (such as roads, transport, electricity) is inadequate in the delta compared to the rest of the country.

In agriculture and allied sectors it has been found that the crop production is a not a more cost-effective business or activity than fishing in IBD. Government can introduce adaptations such as salt tolerant paddy, investment in fish landing jetty and good facility for fish export to enable income generation in these sectors.

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References

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About DECCMA Policy Brief

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The policy brief intended to share initial findings and lessons from research studies commissioned by the program. Papers are intended to foster exchange and dialogue within science and policy circles concerned with climate change adaptation in vulnerability hotspots. As an interim output of the DECCMA project, they have not undergone an external review process. Opinions stated are those of the author(s) and do not necessarily reflect the policies or opinions of IDRC, DFID, or partners. Feedback is welcomed as a means to strengthen these works: some may later be revised for peer-reviewed publication.

