

## **Annex VI: AGRICULTURE & LIVESTOCK**

### **A. Introduction**

1. Agriculture is a dominant sector in the economy of all three tsunami-affected states and the union territory of Pondicherry. In Tamil Nadu, the most severely affected state, the share of agriculture in GSDP (gross state domestic product) at constant prices is 10 percent; in Kerala, Pondicherry and Andhra Pradesh, it is 12, 4 and 21 percent respectively.

2. In Tamil Nadu, about 50 percent of the state's population is still dependent on agriculture. The poorest rural quintile (approximately 1.5 million households with about 7.5 million people) derives more than 75 percent of its income from agriculture, with agriculture wage labor accounting for 50 percent of household income. Agriculture thus feeds a majority of the population, provides employment and livelihood to a majority of the labor force, and supplies raw materials to industries. Marginal and small farm holdings account for 89 percent of total holdings and constitute 52 percent of the agricultural area. The situation is similar in Andhra Pradesh, Kerala and Pondicherry.

3. The livestock sector in the affected districts is mostly a secondary source of income, especially for women. The cost of cattle feed and availability of quality fodder are common limiting factors

4. The coastal region in all three states and the union territory often suffers both in the monsoon and post-monsoon seasons. In monsoon, excess rainwater, prolonged water stagnation, high water table, high humidity and loss of nutrients are common. In the post-monsoon season, high salinity of soil and ground water along with scarcity of freshwater affect crops and animal productivity. The situation in the coastal region is often aggravated by natural calamities such as cyclones. In Tamil Nadu, the tsunami-affected districts faced a grim situation for the third consecutive year due to drought, flood and tsunami.

5. While the tsunami-related agriculture and livestock damage is insignificant relative to the overall size of the sector in all three states and Pondicherry, they have disproportionately affected the poor and marginal groups in the affected areas for whom the impact is catastrophic.

### **B. Damage Overview**

6. This assessment is based on the data survey conducted and collated by the Departments of Agriculture, Horticulture and Animal Husbandry of all the state governments, and field visits made to Cuddalore and Nagapattinam districts of Tamil Nadu, Nellore and Prakasam districts of Andhra Pradesh, and Karaikal region of Pondicherry.

7. Damage to the agricultural sector is mainly confined to the destruction of standing crops like paddy, groundnut, coconut, cashew, mango, banana, ragi and vegetables. Intrusion of seawater into productive fields – as far as two to three km inland – and deposition of infertile sediments in depths ranging from 5 cm to 24 cm in low lying areas has induced salinity and water logging of varying degrees. The damage caused to the soil is of a semi-permanent nature; affected farmers will not be able to grow crops effectively for the next two to three years until seasonal monsoon rain naturally flushes out the salt. In addition, micro eco-systems required for adequate plant growth have been

affected while cultivable lands have suffered erosion and sand casting. Many perennial trees were uprooted; home flower and vegetable gardens, public grazing lands and salt pans were damaged.

8. Poor families in particular have suffered from loss of domestic livestock. The death of animals and damage to pastures are direct impacts. Availability of fodder is also affected since paddy straw was inundated and salinated. This will have a negative impact on the livelihoods of these families, especially of women, since income derived from livestock served as a safety net against the vulnerability of crop failures. It also provided supplementary income and added nutritional value to the diet.

### **Tamil Nadu**

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10. In the livestock sector, in Tamil Nadu, a total of 18,448 animals are reported to have died in the disaster. The production loss of milk, meat and draught work due to this death toll is estimated at Rs. 37.1 crore (\$8.52 million). In Pondicherry, livestock loss is valued at Rs. 3.80 crore (\$0.87 million); whereas in Andhra Pradesh and Kerala, the livestock loss is valued at Rs. 0.24 crore (\$0.06 million) and Rs. 5.08 crore (\$1.17 million), respectively. More than half of agricultural operations and 90 percent of livestock operations are undertaken by women, on whom the livelihood impact is considerable. The impact on landless laborers who work on agriculture and livestock activities is also immense<sup>29</sup>.

### **Pondicherry**

11. In Pondicherry, the impact of the tsunami on the crop and soil varied widely according to location, and was especially severe in Karaikal. The affect from the coast ranged from 0.5 km to one km in Kottucherry Commune up to three km in T.R. Pattinam Commune. The standing crop was totally lost. A total area of 330 ha was cultivated in the coastal villages during the September-October season. About 80 ha of standing crops – paddy, groundnut, banana, vegetables and coconut – were damaged. An area of 687 ha suffered intrusion of seawater and submergence scorching crops such as direct sown paddy, transplanted paddy, and groundnut. In addition, about 316 ha of already saline lands were further deposited with salts and have become saline-sodic. The estimated loss in the agricultural sector is Rs. 4.49 crore (\$1.03 million).

12. Livestock loss is reported to be 560 cattle and 700 poultry birds, and is valued at Rs. 3.80 crores. (\$0.87 million)

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<sup>29</sup> For the impact of this damage on livelihoods, see Annex VI.

## **Andhra Pradesh**

13. About 333 ha of agricultural crops (160 ha of paddy, 120 ha of groundnut and 53 ha of other crops, including ragi) was affected in Nellore, Prakasam and Krishna districts. The extent of damage to standing crops was about 50 percent. The total estimated loss is Rs. 0.90 crore (\$0.21 million). The total animal death was 86 (buffaloes 9; sheep and goat 75; and pigs 2) with the loss valued at Rs. 0.24 crore (\$0.06 million).

14. About 1,410 ha of salt pans were damaged, including loss of the salt crop, silting, and damage to beds, bunds and oil engines. Salt societies and private owners maintained these pans. The total loss in the agriculture and livestock sector is Rs. 3.79 crore (\$0.87 million).

## **Kerala**

15. Damage to crops in Kerala is mainly in the district of Alappuzha and reported as 949 ha. The main affected standing crops are paddy, banana and coconut. Some damage to agriculture infrastructure has been reported in the form of shutters of the spillway which guards paddy cultivation in Kuttanadu from saline water intrusion. The total estimated loss in agriculture is Rs. 15.81 crore (\$3.63 million). Livestock loss includes 105 cattle, 16,600 ducks and 25,310 poultry birds, with another 50 cattle and 2,820 poultry birds reported missing. The total loss in livestock is Rs. 5.08 crore (\$1.17 million).

**Table 1. Estimate Damage and Loss Assessment (Rs. crores)**

Description	Quantity	Estimated Damage	Estimated Loss	Total
<b>Tamil Nadu</b>				
<b>Crops (ha)</b>	6,105	35.00	24.40	59.40
Paddy (irrigated)/rainfed				
Oilseeds (groundnut and coconut);				
Pulses				
Other field crops				
Current fallow lands	7,733		13.91	13.91
Horticultural Crops	628	1.98	7.60	9.58
<b>Irrigation/Drainage</b>				
Farm ponds/shallow dug ponds	552	0.55	2.10	2.65
<b>SubTotal: Agriculture</b>		<b>37.53</b>	<b>48.01</b>	<b>85.54</b>
<b>Livestock</b>	18,448	3.00	34.26	37.26
Cattle and other livestock				
<b>Total (Agri. &amp; Livestock)</b>		<b>40.53</b>	<b>82.27</b>	<b>122.80</b>
<b>Andhra Pradesh</b>				
<b>Agriculture-Crops</b>	333	1.00	0.50	1.50
Livestock (nos)	86	0.55	1.10	1.65
<b>Salt Pans</b>	1,400 ha	0.44	0.20	0.64
<b>Total</b>		<b>1.99</b>	<b>1.80</b>	<b>3.79</b>
<b>Pondicherry</b>				
Agriculture ( crops)	767	2.00	2.25	4.25
Current fallows	316		0.24	0.24
Livestock (nos) cattle	560	1.70	2.10	3.80
Poultry	700			
<b>Total</b>		<b>3.70</b>	<b>4.59</b>	<b>8.29</b>
<b>Kerala</b>				
Agriculture (ha)	949	13.11	2.70	15.81
Livestock (nos) (cattle	105	1.48	3.60	5.08
ducks	16,600			
Poultry &	25,310			
Others)				
Infrastructure damage (shutters)		5.00	2.40	7.40
<b>Total</b>		<b>19.59</b>	<b>8.70</b>	<b>28.29</b>
<b>GRAND TOTAL (Rs. crore)</b>		<b>65.81</b>	<b>97.36</b>	<b>163.17</b>
<b>GRAND TOTAL (\$ million)</b>		<b>15.13</b>	<b>22.38</b>	<b>37.51</b>

**C. Reconstruction strategy**

16. The reconstruction and recovery strategy should include:

- Release of funds for the immediate relief and short term needs outlined above, and necessary to mobilize the inputs required to reclaim the salt-affected lands for crop and livestock production for the ensuing cropping season.
- Involving farmers and other community members, especially women, in identifying needs and immediate priorities of the sector and in decision making in reconstruction activities.
- Completing the analysis of salinity hazards and preparing a reclamation plan with active involvement and participation of the farmers.
- Linking farmers with the formal banking sector and private sector for providing inputs and services related to agriculture and livestock improvement.

#### **D. Reconstruction Needs**

17. Rehabilitation depends on severity and extent of damage and on the capacity to flush out salts and reestablish irrigation and drainage. The reconstruction and recovery should be undertaken in two phases.

##### **Short term**

18. The first or short-term phase should focus on:

- Restoring livelihoods of affected farmers and landless farmers through cash grants, provision of micro-credit, food for work programs, etc.
- Surveying the affected agricultural lands to estimate the extent and grades of salinity/sodicity.
- Reclamation of agriculture land to restore soil fertility by agronomic rehabilitation; scraping and removing marine/mud sediments and sand deposited lands; establishing model reclamation fields; mobilizing saline tolerant seeds, planting materials and green manure crop like Dhaincha, (*Sesbania aculeata*); and introducing bacterial strains like Rhizobia, Azospirillum, Pseudomonas and Phosphobacterium which have the property of nitrogen fixation and phosphate mobilization. Rehabilitation of agricultural lands with little damage will also take place naturally through seasonal monsoon rain and re-leveling of fields.
- Reviving horticultural crops with and without soil amelioration.
- Restoring affected pasture lands, farm ponds and dug wells.
- Estimating the quality of water from shallow tube wells, farm ponds, open wells and other irrigation sources; and identifying the pockets where ground water can still be tapped.
- Providing fodder for animals and arranging vaccination for livestock.
- Re-establishment of home gardens with salt tolerant vegetables like eggplant and tomato, and flowers like crossandra.

##### **Medium-term**

19. Agriculture and livestock production capabilities have to be enabled by restoring and promoting sustainable management of coastal land and water resources. The rehabilitation of lands in rainfed areas where water shortage is a limiting factor for flushing of lands is a priority as observed in Nagapattinam district of Tamil Nadu.

20. Other required interventions include: Land reclamation and soil improvement; rainfed agriculture on watershed basis; fodder development; risk mitigation through diversification into non-farm activities; local post-harvest value addition, including setting up of rural godowns and bringing crop and livestock insurance as an integral component of productive activity; capacity building of farmers, including women, through lateral learning and demonstration of environmentally sustainable farm techniques; strengthening coastal saline management research and development activities, and initiating a coastal bio-shield with a suitable combination of trees.

**Table 2. Needs Assessment for Agriculture and Livestock Sector (Rs. crores)**

Sl. No	Activity	Tamil Nadu		Pondicherry		Andhra Pradesh		Kerala		TOTAL
		Short term	Medium term	Short term	Medium term	Short term	Medium term	Short term	Medium term	
1	Replacement cost to crop and live stock losses	10.85	10.85	1.33	1.33	0.47	0.47	4.06	4.06	33.42
2	Rehabilitation of soil resources (Soil reclamation)	17.66	17.66	0.69	0.69	0.72	0.72	8.12	8.12	54.38
3	Strengthening marketing and support services	0.37	3.76	0.15	0.45	0.03	0.05	0.67	0.94	6.42
	<b>TOTAL (Rs. crore)</b>	<b>28.88</b>	<b>32.27</b>	<b>2.17</b>	<b>2.47</b>	<b>1.22</b>	<b>1.24</b>	<b>12.85</b>	<b>13.12</b>	<b>94.22</b>
	<b>TOTAL (\$ million)</b>	<b>6.64</b>	<b>7.42</b>	<b>0.50</b>	<b>0.57</b>	<b>0.28</b>	<b>0.29</b>	<b>2.95</b>	<b>3.01</b>	<b>21.66</b>