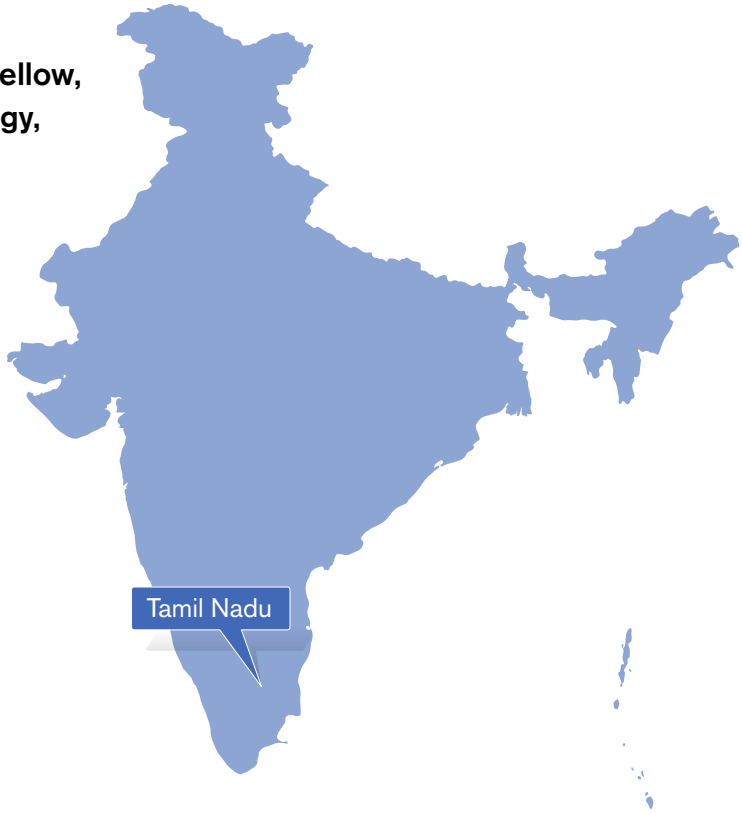
Social disruption (migration and displacement)

Climate migration's growing threat to marginalised people in Tamil Nadu, India

C. M. Pratheepa, Post Doctoral Research Fellow, and R. Rengalakhmi, Director, Ecotechnology, M S Swaminathan Reasearch Foundation (MSSRF), Chennai



Location	Tamil Nadu state, India
Climate hazards	Land degradation due to fast onset events (tsunami, cyclones) and slow onset events (increased soil and groundwater salinity)
Non-economic loss and damage	Declining food production and changing land use increasing migration of male workers; deeper gender divides and social inequality; increased vulnerability for women (gender-based violence and other), landless people and Dalit community; the 'feminisation' of farming, with women's work less valued and lower paid
Coping measures	Converting some land to aquaculture, leaving the land fallow or changing to high-value crops; leasing land from landed farmers; small income-generating activities

Context

Migration has been considered a climate risk management strategy in the form of adaptation, causing both economic and non-economic gains and losses. Given the importance of non-economic loss and damage (NELD), this case study explores the ground reality of climate migration and the incidence of NELD on individuals, society and the environment in the coastal agro-ecosystem of Tamil Nadu state, India.

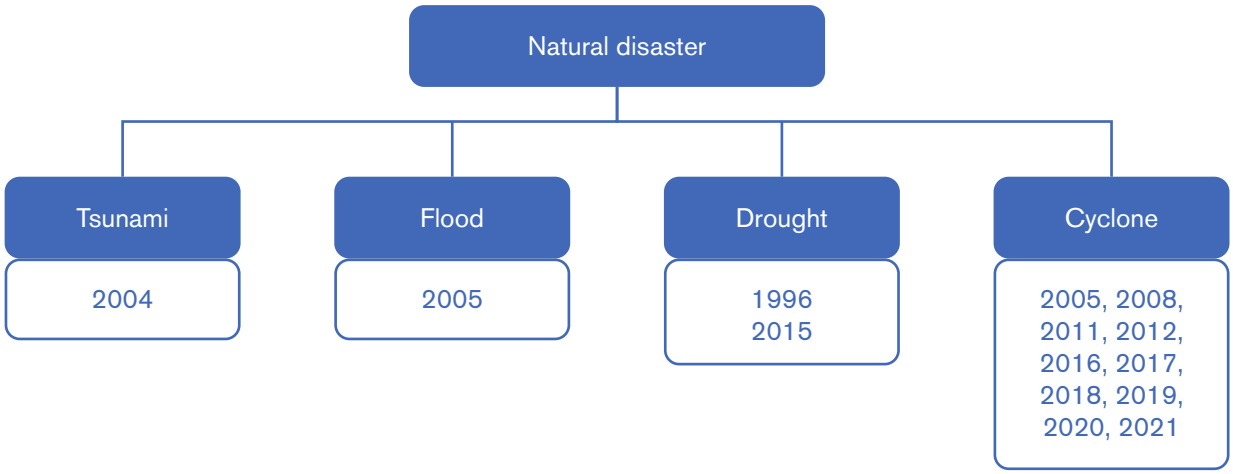
The study area is a coastal village in Sirkazhi block, which is in the Mayiladuthurai district in the state of Tamil Nadu in India. Both fishing and agriculture are the primary livelihoods of the local communities. Because it was once part of Kaveripattinam, popularly known as "Puhar" and the main port of the Chola dynasty (9th to 13th century), it is a region of archaeological significance. The village covers a l geographical area of 801 ha and has a population of 6,853 (Census of India, 2011). There are 416 agricultural labourers (who are landless and dependent on agricultural work) and 152 cultivators (of which more than 70% are smallholders). However, in the recent past, there has been a changing trend, with farming now becoming a seasonal and secondary occupation. This change has been driven by increasing climate risks coupled with anthropogenic factors. The village comprises seven hamlets; the study was carried out in only five, where farming remains an important means of livelihood, while the other two largely depend on fishing and aquaculture.

As the study area is located on the Coromandel coast (Figure 1), it is highly vulnerable to several natural hazards: cyclones, seasonal floods and droughts, sea surges, extreme events and tsunamis. These climatic hazards are rising in intensity and frequency, and the climate crisis is emerging as an important pull factor in development. Infrastructure, waterways, water bodies, wetlands, common lands and agriculture have regularly been exposed to extensive damage as a result of these catastrophes. In addition, it has been reported that sea-level rise is a critical climate risk that adversely impacts agroecosystems (Ramachandran et al., 2017 and Kankara, 2023). The exposure of farming systems to the above-mentioned climate risks and the associated reduction of environmental co-benefits, such as groundwater, vegetation, soil nutrient cycles and pest regulation, are deeply impacting livelihoods by aggravating the vulnerability of smallholders.

Figure 1. Location of the study area. Source: GIS lab, MSSRF

The Indian Ocean Tsunami devastated the area in 2004, mirroring the catastrophic waters that devoured the prestigious port city of 'Puhar' — as chronicled in ancient Sangam Tamil literature — and the study area was one of the worst-hit villages located next to Puhar. At the time of Tsunami, the extended stagnation of seawater and mud in the agriculture fields meant that both the water and soil became salinised. Even after more than 15 years of tsunamis, the Indian Ocean event's adverse impact on soil and water continues to deeply influence farming and has been more complex and challenging to farmers. These increasing exposures to climate risks result in a range of sensitivity factors: a reduction in the net sown area, changes in the cropping systems, declining soil health, and increasing soil and water salinisation. These conditions compound the vulnerability and reduce local communities' adaptive capacities.

Figure 2. The impact of natural disasters on agriculture in Sirkazhi villages during the 1992–2021 period. Source: Primary data, MSSRF



Impacts (social disruption and migration)

Climate change and other anthropogenic factors have combined to become the main driver of migration as an adaptation strategy for households, in their efforts to reduce vulnerabilities due to the fall in agricultural production. This has a gender dimension that, with other intersectional factors, mediates between social relations, socioeconomic changes and climate adaptation strategies. This has significant implications for gender roles, traditional gender norms, women's workloads and their health.

Since the 2004 Tsunami, the soil salinity level has been increasing. With an electrical conductivity of 3 to 4.98 millimhos/cm in soil, along with moderate runoff and slow infiltration, the soil has become unsuitable for the cultivation of food crops (Pratheepa et al., 2022). The increasing salinity after 2004 compelled some farmers to shift to shrimp farming; this transition was only possible for prosperous men farmers, due to being capital-intensive and requiring the support of external institutions for input and output markets. This led many small farmers to cultivate crops just once a year, without leaving land fallow. Foreseeing the increasing salinity, most of the smallholders from the Dalit or Scheduled Caste (SC[1]) community, along with some members of the Most Backward Class (MBC) community, sold their land to a private company. These changes in land ownership deepened their vulnerabilities, as SC households were compelled to work on the land they had sold to private companies without a land title (land number in their name), making them unable to get crop insurance in case of disaster. Approximately 35% of the decline in the cultivable land has been recorded from the 1991–2011 period, with a decline from 284.1 ha (census of India) to 211.58 ha in 2019-20 (according to records from the village administrative office in 2020).

The primary change has been the shift from growing three crops per year to simply one: a reduction in the cropping intensity alongside changing the cropping systems. Paddy, a primary food crop for smallholding farm households has been replaced by cotton, due to changes in the rainfall pattern, increasing soil salinisation and a reduction in surface water. In the past, households cultivated different traditional varieties of paddy with salinity tolerance, millets and groundnuts. Besides the decline in crop diversity in the main fields, the drylands were degraded, which negatively impacted the tree crops, such as the coconut and mango orchards. A rise in the cultivation of other cash crops in the paddy/millet fields led to a significant impact on women's role in ensuring household food security, due to a substantial reduction in paddy cultivation and production in favour of more chemical-intensive, and therefore expensive, cotton cropping.

1 The Scheduled Caste (SC) is an officially designated group in India that comprises people from the lowest castes, who are considered 'untouchable' in orthodox Hindu scriptures and practice, and officially regarded as socially disadvantaged.

> Salinity is the main reason only our cropping pattern and crops have changed. We have never planted cotton before [in the previous decade] ... Only after the salinity in farmlands [have] we adapted to cultivate cotton. We used to cultivate paddy in all three seasons [for two decades], but now we cultivate paddy only in [the] second season. Some have started horticultural crops.
>
> Focus group discussion (FGD) with women farmers

These changes in agriculture are adding to the mental stress of women and men as they are increasingly falling back on informal sources for credit with higher interest rates. It has also impacted local employment; men have shifted to non-farm sectors with semi-skilled and regular employment with higher wages, while women have stayed back to manage the farming along with caring for children and aged parents in their families.

Figure 3. Farmland converted for shrimp cultivation. Source: MSSRF

Until 2000, migration as a strategy to overcome distress in farming was rare among the coastal farming community. However, the situation has changed since the Indian Ocean Tsunami in 2004. After this event, the rate of migration increased as there was less scope for agriculture due to seawater entry into agricultural land, which increased the soil salinity (Primary data, 2020). Subsequently, the frequent cyclones and coastal surges further compounded the risk of soil salinity, rendering the fertile agricultural land less productive. The migration pattern was gendered: mostly men migrated outside the village to the non-farm sector while women stayed in the village and were forced to continue the agriculture. A migrant temple construction worker shared: "It is difficult to stay in the village with salinity-affected land, and farming in this land is less profitable to run a family of six … Migration is inevitable in such a situation."

Figure 4. Cultivation of cotton in paddy field. Source: MSSRF

Although it was evident that men's migration had a positive impact on ensuring the financial assets of the households, the women respondents also talked about gendered dimensions of loss and damage in the FGD, highlighting their increasing vulnerability: "Our land is drying and dying now, and we don't have scope for good income and food from our land. Migration of our men is the only option to sustain our lives and family."

The decline in agricultural production has forced men and women to diversify or take up alternative employment in the non-farm sector, outside or within the village respectively, to sustain their families. Here, existing social inequalities, especially caste hierarchy and land ownership (class) have decided the type of employment rather than gender. In addition, education has shaped these inequalities further. Among these, caste has played a major role in securing well-paid jobs among migrants. In this case study, there were 344 migrants in the village including 250 inter-state migrants, 28 intra-state migrants and 66 overseas migrants (Table 1).

Table 1. Nature of work, gender, caste and destination.

Type of work	Gender	Number of persons migrated	Caste and landholding status	Location (state/ district)	Wage per day (INR)
Mason	Male	105	MBC, landed and landless	Intra district and inter state	1000
Temple construction	Male	90	MBC, landed and landless	Andhra Pradesh, Telangana and Karnataka (inter-state)	1500
Helper to mason	Male	55	SC, landless	Coimbatore, Tamil Nadu (intra-state)	750
Spinning mill	Female	28	Mostly SC, very few from MBC landless households	Tirupur, Tamil Nadu (intra-state)	800
Overseas migrants	Male	66	MBC and SC, mostly landholders	Arab countries (outside the country)	2000

Source: primary data from the field

Migrants belonging to the MBC community are usually employed in skilled work like construction (mason work and temple construction) or as drivers and office assistants in overseas employment. In contrast, those from the SC community occupy mainly unskilled positions such as assistants of masons (100%) and other unskilled work in overseas employment. Along with this, some young girls have migrated to spinning mills in Tamil Nadu for better wages. Most of these girls are from SC households, with only a few from landless MBC households recently taking this work to support their families (which is not permitted among landed MBC households).

A gradual shift in livelihoods has also been observed in farming, where individuals with lower education levels tend to take unskilled work with lower wages, but more moneyed individuals are able to seek better paid employment. Climate migration has also made a remarkable change in gender relations and thus created more challenges for women in society.

As mentioned above, the migration of men has forced women to take up more agricultural tasks. However, among the women who have been left behind, the magnitude and type of work has differed according to their social position. The households that are in the socially middle position of the caste hierarchy (MBC) mostly own land, and a much smaller number are landless. But the reverse is true in households in the lower rung of the social system (SC), where only a small proportion of the households own land, and most are landless agricultural workers. Due to a reduction in local employment opportunities in agriculture production, SC women have leased land from higher caste households and started farming. Thus, SC women, who were earlier agricultural workers, now take an active role as 'farmers' on the leased land, mainly producing paddy for subsistence, with a smaller proportion being sold in the market. Similarly, both landless and land holding MBC women's participation in agriculture has increased after their husbands' migration. In affluent households, women have not engaged in any agricultural tasks, even after migration.

Similarly, this inequality has continued in non-farm small enterprises/income generating work undertaken by women within the village. Women from SC households take up unskilled work, and MBC households take up skilled and semi-skilled work. However, women from both landless MBC and SC households have been engaging in income-generating activities like tailoring, basket weaving and doll making, which only take place within the house. But food processing — namely selling batter and curd — and running eateries or tea and coffee shops are areas that have been taken up by women from MBC households within the village. However, the women from the SC community never get involved in these types of work due to the social stigma of untouchability prevailing in their society.

The Mahatma Gandhi National Rural Employment Guarantee Scheme of the Government of India grants all women 100 days of employment within the village. This is the only national programme where work is allocated to women, though it is mostly middle-aged and older women who are participating. However, this is done in two batches: separately for women from MBC and SC households, reiterating caste-based marginalisation and segregation in society.

Compounding risks

The existing risks of soil salinity due to sea surges, inadequate rainfall, increasing seasonal flooding and cyclones are compounded by current structural inequalities, especially in terms of land and caste. These existing vulnerabilities and exposures are further deepened by increasingly frequent hazards, which in turn further intensify the risks and make the community more vulnerable. These climate impacts mean women agricultural workers are losing their employment opportunities within the village, where the land-use is changing to shrimp farming. The increasing soil salinity is making small holding farmers from the SC community landless, as they have been forced to sell the land due to its declining quality for cultivation. Conversely, when women take a lead role in agriculture, the prevalence of existing social norms in care and responsibility in household food security means that crop choices and farming strategies are not aimed towards profit, tending to continue the use of land for cultivation without leaving fallow. This keeps women in livelihoods that are underpaid and undervalued, which is further compounded when salinity is increasing due to climatic events.

Vulnerabilities/impacts of compounding risks

Women's work burden and health: in terms of changes in household labour availability, the absence of men leads women (both landless MBC and SC) to take agricultural daily wage work in addition to household work. This increases their work burden and adversely impacts health. For example, they tend to skip breakfast and have tea and snacks provided at work, as they don't find time to cook and eat. In addition to productive work pressures, responsibilities for other household maintenance have also increased and become more demanding of women's time, especially in terms of the following: paying bills such as school fees and maintaining payment receipts such as for tax or EB, attending school meetings, caring for children and in-laws when they are sick and admitted to hospitals, and looking after the overall savings and expenditure. In addition, the daily fetching of water is a hurdle, as accessing drinking water is challenging due to the increasing salinity of groundwater: women spend two hours each day engaged in this task, which also physically exhausts their energy.

Figure 5. Women spent more time collecting potable water. Source: MSSRF

Women's agency in productive work: this case study has shown that, at the societal level, women's (gender) role in agriculture has diversified and increased in multiple folds, but with no comparative increase in their agency. Existing inequalities such as gendered wage disparity and discrimination still prevail, which further increases women's exposure. This is because of the dominant social norm of considering women 'farm labourers' and not 'farmers'. Historically, women from the landed MBC household were only engaged in preparing and providing tea and snacks to labourers, as a support role to their husbands, but a reduction in the household labour force means they are now involved in the farm work.

This feminisation of the agricultural labour force makes women more vulnerable and marginalised, as their share of labour shoots up drastically. This has both positive and negative implications for women's agency, meaning their gains and losses need to be analysed carefully. This phenomenon in farming is not associated with changing women's access to productive resources and services such as technology, knowledge, institutional links and credit input/output markets. Instead, it deepens their vulnerability, and is linked with low agricultural productivity, low earnings, poor job security and growing food insecurity.

Gender-based violence: climate migration exacerbates gender-based violence against women with limited access to and control over productive resources. With increasing natural hazards, they frequently face food insecurity and declining labour opportunities within the village due to a reduction in the net sown area, crop productivity and farm income. Consequently, women access credit to run their households from informal sources at higher interest rates, or depend on land owners for labour opportunities within the village. This dependency makes them vulnerable and the creditors/land owners berate them, even demanding sexual favours in some cases: "There are times when men ask us to work behind the field alone, claiming that they need assistance. But it is always for making sexual advances. It affects us psychologically as if we were slaves."

Even though these interactions are typically framed as consensual, the reality is that the women engage in them because they have no other options. Lack of sufficient, timely and regular support from their husbands regarding remittances to meet food and other household expenses pushes women to agree to such favours. The landlords take advantage of their vulnerable conditions and exploit them physically and mentally. Of significance here is that there has also been an increase in orphans and young widows due to men's overconsumption of alcohol, with those men dying early or giving up their care-giving responsibilities, making the women and children in their families more vulnerable. Such circumstances have profound psychological effects on families, with declining mental health and wellbeing, which can in extreme cases lead to suicide.

Coping measures

The coping/adapting strategies observed in this case study have been diverse and gendered, with largely competitive outcomes that negatively impact more vulnerable sections of the community. This is mainly due to existing social and economic inequalities, and exposure to climate impacts. The adaptive strategies of women left behind in the village intersect with other social, economic and demographic variables, namely caste, class and age. Adaptation strategies at the local level are shaped and deepened by class and caste discrimination, which is further intensified by socioeconomic inequalities. To cope with and adapt to increasing soil salinity, the households with large land holdings have undertaken a range of actions. These include: converting a portion of land to aquaculture, leaving the land fallow or changing to high-value crops (tree/cotton). But the change in the land use to shrimp farming further deepens the environmental and social vulnerabilities of the landless, as well as small holding farmers, by increasing salinity (Pratheepa et al., 2022). Conversely, some women from landless households have strengthened their livelihoods by leasing the land from landed farmers, with the associated risks in crop production. Also, irrespective of caste, landless women have been trying to diversify their livelihoods by undertaking small income-generating activities, but landed women, who were previously engaged in supportive roles, are either now involved in managerial roles or remain in domestic and care work. Again, these outcomes have been shaped by the class and remittances these women receive from their husbands. Despite there being diverse categories of women, migration is impacting them by increasing their workloads, and changing gender roles and decision making in farming. Some of the women in this case study have started adopting eco-friendly farming practices, but this has largely been mediated by the existing social norms associated with household work, as well as women's limited mobility and lack of access to productive resources.

Support needed in future

The kind of support needed here is to engage in action research to understand the potential pathways that reduce women's vulnerability and decrease environmental degradation. This should involve specific support in the form of capacity building for designing the study, data collection and analysis of the pathways for improving adaptive capacities. Specifically, technical support is needed to link and synthesise the field level learnings into theoretical frameworks and pathways.

Although there has been an effort to improve the salinity management of public land by leveraging existing government schemes, financial support is still necessary to facilitate the whole process in a co-management approach to ensure their participation and ownership. In addition, there is a need to improve women farmers and workers' access to productive resources by harnessing and promoting their collective power. This needs to be closely promoted at the field level.

Based on the emerging field evidence, technical support and guidance is needed to convert the learning to potentially influence policies, both at the state and national levels.

Lessons learned

Women from poor and marginalised households have less adaptive capacities due to limited access to assets and resources such as land and credit, as well as lesser access to local employment, technology, institutional links, decision-making processes and the market during climate change-induced events and disasters. Increasing climate risks exacerbate existing social and gender-related inequalities and vulnerabilities of poor people and women-managed households. Such adverse impacts are shaped by the fact that women and other disadvantaged groups are already marginalised in their resource access and ownership. It is evident from this case study that increased climate-induced environmental degradation, along with the degree of that exposure, increases gender-based violence. Despite a substantial increase in workload and changing gender roles and relations, gendered discrimination in terms of lower wages and the undervaluing of women's labour remains. Strategies to improve marginalised people's adaptive capacity to withstand increasing climate risks (co-evolved from women and men farmers) include:

a. Strengthen women's access to productive resources and services where collective power and social capital need attention, in areas such as land, credit, salinity management technologies, new institutional linkages, and inputs including farm machinery and markets.

b. Build evidence to comprehend nuanced patterns of changes, with an intersectional lens to account for different sections of the community.

c. Develop analytical frameworks and collect data to understand how these changes are impacting both the paid and unpaid work of women at the household level as well as women's agency in productive work.

d. Reduce the intensity of environmental degradation by investing in common and individual land to reduce soil and water salinity.

e. Build awareness and facilitate necessary institutional arrangements like women's collectives and agencies that support/facilitate women's access to land, credit and marketing at the village level, to address gender-based violence due to agricultural distress (aggravated due to climate risks).

f. Offer differential support with consideration of the intersectional elements that shape people's vulnerabilities and adaptive capacities. The women belonging to the landed MBC group were better able to cope than those in the landless MBC and SC groups, and this was because of the former's improved access to wealth and skills. Hence, skill development and appropriate training for vulnerable groups should be given top priority as these benefits could provide opportunities for a better living.

g. Address access to credit: informal credit being used as a last resort by women to sustain their families can lead to gender-based violence; when such debts are not re-paid, there is an opportunity for moneylenders to demand sexual favours. Therefore, women need better access to formal financial and credit services so they don't depend on these informal sources.

h. Increase the value of women's time: fetching water takes a long time, leaving women with less for productive work. Measures are needed to provide safe and regular access to both drinking and domestic water needs.

Synopsis

This paper discusses how climatic factors are deepening the vulnerabilities of small farmers and agricultural workers, pushing men's migration to the non-farm sector. These changes exacerbate pre-existing gender divides and social inequality, thereby intensifying the vulnerability of those left behind: mainly women, landless people and the socially marginalised (Dalit) community. Appropriate strategies need to be identified, to assess intersectional micro-level NELD. Regional level need-based policies should also be developed and effectively implemented, to prevent salinity-induced land degradation. This means vulnerability could be minimised, with changes in the pattern of men's migration. In addition, women's collective power could be harnessed by empowering them to act independently via formal credit and adequate backward and forward linkages to ensure their sustainable livelihood.

References

Kankara, R S, Gunasekaran, P, Silamban, D (2022) Vulnerability Analysis of Sea Level Rise (SLR) on a Micro-tidal Coast: A Case Study of Nagapattinam Coast. In: Khare, N (ed) *Science, Policies and Conflicts of Climate Change*. Springer Climate. https://doi.org/10.1007/978-3-031-16254-1_5

Pratheepa, C M, Rengalakshmi, R and Sinha, S (2022) The socio-ecological contradictions of land degradation and coastal agriculture in south India. *Environment and Planning E: Nature and Space* 6(1) 391–411. https://doi.org/10.1177/25148486221079720

Ramachandran, A, Khan A S, Palanivelu, K and Prasannavenkatesh, R (2017) Projection of climate change-induced sea-level rise for the coasts of Tamil Nadu and Puducherry, India using SimCLIM: a first step towards planning adaptation policies. *Journal of Coastal Conservation* 21(23) 1–12. https://doi.org/10.1007/s11852-017-0532-6