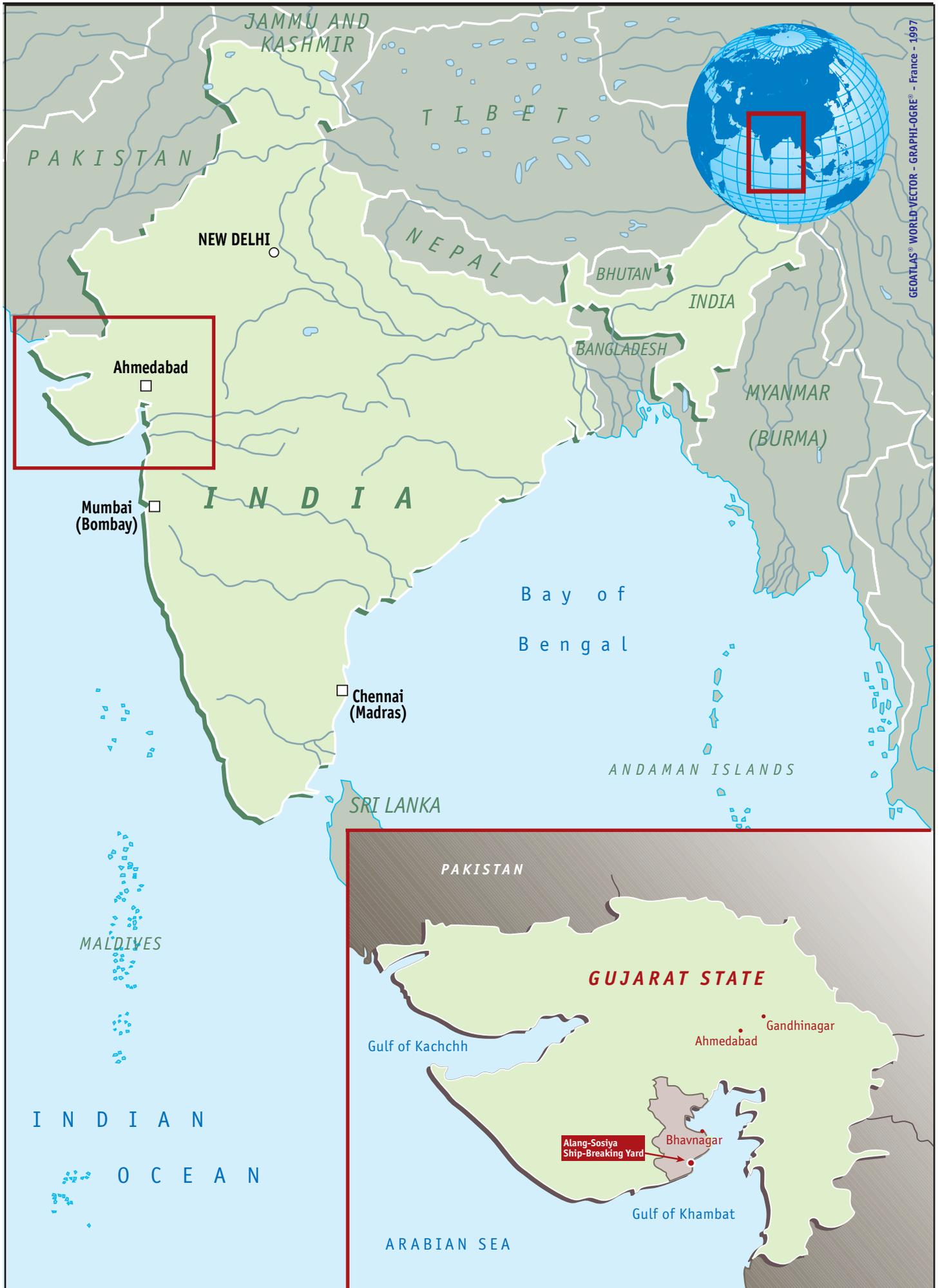


# Impacts and Challenges of a large coastal industry

*Alang-Sosiya Ship-Breaking Yard  
Gujarat, India*



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**Impacts and Challenges  
of a large coastal industry**

*Alang-Sosiya Ship-Breaking Yard  
Gujarat, India*

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website: [www.unesco.org/csi](http://www.unesco.org/csi)

*Report written by:* Derek Elias, based on the following project reports:

- Bhavnagar University (2000). UNESCO-CSI Pilot Project on Coastal Management of Alang and Sosia Ship-Breaking Yard: Report on Phase 1 of Project (Environmental Analysis). Bhavnagar University: Bhavnagar, Gujarat.
- Bhavnagar University (2001). Sustainable Development of Alang-Sosiya Ship-Breaking Yard: Report on Phase 2 of Project (Stakeholder Issues). Bhavnagar University: Bhavnagar, Gujarat.
- Joshi, V., R. Abdi and N. Gohil (2003). Socio-Cultural and Ecological Impact of Alang and Sosiya Ship-Breaking Yard: Third Phase Report on Stakeholders' Convergence. Centre for Social Studies, Surat and Bhavnagar University, Gujarat.

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“ Each leased plot at ASSBY employs between 150–200 workers and towards the end of 2003 there were around 15,000 workers employed in approximately 80 working plots. Over 90% of the total labourers engaged at ASSBY are migrants, who come seeking better employment opportunities than those available in their home states... ”



## FOREWORD

The adverse impacts of unplanned and uncontrolled industrialization have been well publicised. In this context, the creation of a major operation such as the Alang-Sosiya Ship-Breaking Yard (ASSBY) in a sensitive coastal area in the state of Gujarat, India, presents many challenges and lessons for practitioners of integrated coastal management.

A multidisciplinary field project, focusing on managing conflicts – environmental, social and economic – among the major stakeholder groups involved at ASSBY has been initiated by the United Nations Educational, Scientific and Cultural Organization through the Environment and Development in Coastal Regions and in Small Islands platform.

The sheer size and scope of the ship-breaking activities at ASSBY has necessitated tailoring a project that could effectively address the unique and complex nature of the social upheavals and environmental impacts that have been experienced in the vicinity over the last twenty years. The activities have involved researchers from a variety of institutions and disciplines and have raised awareness and prompted changes of attitude on environmental and social problems among stakeholders. The development of an effective communication process for the management and resolution of the social and environmental problems at ASSBY is the cornerstone for sustainable development in this coastal region, and is essentially a long-term objective.

The present document reports on the results of the work undertaken, the results achieved and future project directions. Sincere thanks and appreciation go to those individuals, institutions and agencies who have supported and participated in the project thus far, and in particular Bhavnagar University and the Centre for Social Studies, South Gujarat University; key stakeholder groups, namely the villagers, migrant workers, the Gujarat Maritime Board and the ship-breakers; the Gujarat Ecology Commission, the Iron Steel Scrap & Ship-Breakers Association of India and the Gujarat Ship-Breakers Association. Special thanks are also due to Rupa Abdi for her invaluable assistance in the preparation of this report.

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## પ્રસ્તાવના

# બિ

ન આધારિત અને અનિયંત્રિત ઔદ્યોગીકરણની વિપરીત અસરો સુવિદિત છે. આ સંદર્ભમાં ગુજરાતનાં સંવેદનશીલ તટીય વિસ્તારમાં અલંગ સોસિયા શીપ બ્રેકિંગ યાર્ડ (ASSBY) જેવા મોટા કામનું નિર્માણ સંકલિત તટીય સંચાલનનાં કાર્યક્રમો સામે ઘણાં પડકાર રજૂ કરે છે.

ASSBY સાથે સંકળાયેલા મુખ્ય જૂથો વચ્ચેનાં પર્યાવરણને લગતા સામાજિક અને આર્થિક વિવાદો પર કેન્દ્રિત થતો એક બહુભાષીય ફીલ્ડ પ્રોજેક્ટ સંયુક્તરાષ્ટ્રની શૈક્ષણિક વૈજ્ઞાનિક અને સાંસ્કૃતિક સંસ્થા (UNESCO) એ તટીય વિસ્તારો અને નાના ટાપુઓમાં પર્યાવરણ અને વિકાસ (CSI) મંચ દ્વારા શરૂ કરેલ છે.

ASSBY ની પ્રવૃત્તિઓનાં વિસ્તાર અને ઠેતુને લીધે એક એવો પ્રોજેક્ટ તૈયાર કરવાની જરૂર ઊભી થઈ કે જે છેલ્લા વીસ વર્ષોમાં આજુબાજુનાં વિસ્તારોમાં અનુભવાતી પર્યાવરણની અસરો અને સામાજિક ઉઘલપાઘલના અનુભવ અને જટિલ સ્વરૂપને અસરકારક રીતે ઊદ્દેશી શકે. પ્રવૃત્તિઓએ વિવિધ સંસ્થાઓ અને શાખાઓમાંના સંશોધકોને સાંકળ્યા છે તથા સંકળાયેલા જૂથોમાં પર્યાવરણને લગતા અને સામાજિક પ્રશ્નો પ્રત્યે અભિગમમાં બદલાવ લાવ્યો છે તથા જાગૃતિ વધારી છે. કાંઠાનાં વિસ્તારોનાં સંતુલિત વિકાસ માટે ASSBY નાં સંચાલન અને સામાજિક તથા પર્યાવરણને લગતા પ્રશ્નોને લગતા અસરકારક સંચાર પ્રક્રિયાનો વિકાસ પાયારૂપ છે. જે એક મૂળભૂત ઠેતુ છે.

આ પ્રકાશનમાં હાથ ધરાયેલા કાર્યના પરિણામો, સિદ્ધિઓ અને ભવિષ્યનાં પ્રોજેક્ટ માટેનાં સૂચનો રજૂ કરવામાં આવે છે. પ્રોજેક્ટમાં મદદ કરનાર અને ભાગ લેનાર વ્યક્તિઓ, સંસ્થાઓ અને ખાસ કરીને ભાવનગર યુનિવર્સિટી, સેન્ટર ફોર સોશયલ સ્ટડીઝ, સાઉથ ગુજાત યુનિવર્સિટી સંકળાયેલા મુખ્ય જૂથો- ગામનાં લોકો, સ્થાણાંતરીત મજૂરો, ગુજરાત મેરી ટાઇમ બોર્ડ અને શીપ બ્રેકર્સ, ગુજરાત ઈંજીલોજી કમિશન, ઘ આયર્ન સ્ટીલ સ્કેપ એન્ડ શીપ બ્રેકર્સ એસોસિએશન ઓફ ઈન્ડિયા અને ઘ ગુજરાત શીપ બ્રેકર્સ એસોસિએશન બાબાર અને સરાઠનાને પાત્ર છે. આ પ્રકાશન તૈયાર કરવામાં મળેલી રૂપા આબિદની વિશેષ મદદ બદલ આભાર.

### વિદ્યુત જોષી

ભુતપૂર્વ કુલપતિ ભાવનગર  
યુનિવર્સિટી તથા સીનીયર ફેલો,  
સેન્ટર ફોર સોશયલ સ્ટડીઝ,  
સાઉથ ગુજરાત યુનિવર્સિટી

### ઠરિશ્વંક દૂબે

ભુતપૂર્વ અધ્યાક્ષ સાઈકોસાયન્સીઝ  
ભાવનગર ભાવનગર યુનિવર્સિટી

### ડૉક્ટર જી દ્રેસ્ટ

અધ્યાક્ષ, UNESCO, CSI

### કેરિક એલ્યાસ તથા

### ગિલિઅન સેમ્બર્સ

CSI સલાહકારો

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## EXECUTIVE SUMMARY

Ship-breaking activities commenced in 1983 on the beaches immediately adjacent to the villages of Alang and Sosiya in the state of Gujarat, India and subsequently evolved into a large industrial operation, the Alang-Sosiya Ship-Breaking Yard (ASSBY). Twenty years ago, government policy for comparatively new and novel industries such as ship-breaking, was in the developmental stage, and as a result, activities at ASSBY were largely unplanned and unregulated. Despite threats of sanctions, heavy criticism of environmental and social problems, and increased competition from yards in Bangladesh, China, Pakistan, the Philippines and Taiwan, ASSBY has become one of the largest ship-breaking yards in the world. Nevertheless, there has been a reduction in the number of operational plots from over 100 (out of a potential 185) in 1996, to 80 at the end of 2003.

Commencing in February 1999, a multidisciplinary team of researchers from both natural and social sciences at Bhavnagar University undertook research on the biophysical and social impacts of ASSBY. This work was supported by the United Nations Educational, Scientific and Cultural Organization (UNESCO) platform for Environment and Development in Coastal Regions and in Small Islands (CSI). This research has evolved into an ongoing field project within the wider framework of CSI's efforts to develop, document and test wise coastal practices for sustainable human development.

The initial objectives of the project were to determine the socio-cultural, economic and environmental impacts of ASSBY on the human communities and ecosystems in the immediate area. As no integrated, multidisciplinary study had been undertaken previously, there was little opportunity to make 'before' and 'after' comparisons. The study included surveys of flora, waterfowl and water resources as well as analysis of the economic, social and cultural ramifications of development within the study area. Further work on water resources and management was completed in mid-2002.

Following an important workshop, attended by many of the crucial stakeholders, and held in Bhavnagar, Gujarat State in July 2000, the field project was re-focused to identify the major stakeholder groups and their con-

cerns relating to ASSBY. Then, following individual consultations, the main stakeholder groups – villagers, migrant workers, ship-breakers and the Gujarat Maritime Board – met during multi-stakeholder workshops held in Bhavnagar in May 2001 and again in October 2003.

Through such ongoing dialogue the project activities have led to a better understanding and some improvement of the problems posed by environmental pollution, poor health and working conditions, and the lack of basic infrastructure and services. Convergence and dialogue are the keys for success. All of the stakeholder groups have displayed a willingness to address the problems. Awareness-raising, changes in attitude and specific actions have made some impact; nevertheless, there is still a long way to go.

The biggest challenge facing any consensus-building process is to devise an appropriate communication mechanism which will regularly bring the stakeholder groups together on a common platform to discuss issues of mutual concern, to reach agreement on their solution and to implement those agreements. Ship-breaking is a profit-driven business and thus market forces are most effective in regulating the interests and behaviour of the stakeholders, in particular, the ship-breakers. Therefore attention needs to be accorded to how the activities can capitalize on these forces to realize project goals.

## ઉપસંહાર

# ગુ

જ્ઞાત (ભારત)નાં ગામડાઓ અલંગ અને સોસીયાનાં તદ્દન નજીકનાં ક્રાંતિ ૧૯૮૩માં (શીપબોર્ડિંગ)ની પ્રવૃત્તિ શરૂ થઈ જે ધીરે ધીરે એક મોટી ઔદ્યોગિક પ્રવૃત્તિ ASSBY માં પરિણમી વીસ વર્ષ પહેલાં શીપબોર્ડિંગ જેવા પ્રમાણમાં નવા અને ઉમદા ઉદ્યોગ માટે સરકારની નીતિ થોડી પ્રાથમિક તબક્કામાં હતી પરિણામે ASSBY ખાતે પ્રવૃત્તિઓ મોટા ભાગે આયોજન વિનાના અને અનિયંત્રિત હતી. પ્રતિબંધના ડર, પર્યાવરણ અને સામાજિક પ્રશ્નો અંગે આકરી ટીકાઓ, દક્ષિણ પૂર્વ એશિયાઈ દેશોનાં ધાર્ક સાથે વધતી જતી સ્પર્ધા છતાં પણ ASSBY વિશ્વનાં મોટા ધાર્કમાનું એક બન્યું. જોકે કુલ ૧૮૫માંથી સક્રિય પ્લોટની સંખ્યામાં ઘટાડો જેવા મળ્યો છે. ૧૯૯૬માં જે સંખ્યા ૧૦૦થી વધારે હતી તે ૨૦૦૩ના અંત સુધીમાં ૮૦ જેટલી થઈ છે.

ફેબ્રુઆરી ૧૯૯૯થી ભાવનગર યુનિવર્સિટીના જીવ અને સામાજિક વિજ્ઞાનની વિવિધ શાખાઓની સંશોધકોની ટીમે ASSBY ની પર્યાવરણ અને સામાજિક વ્યવસ્થા પર અસરો અને સંશોધન શરૂ કર્યું. આ કામને UNESCO, CSI દ્વારા સહાય મળેલ. દરિયા કાંઠાના વિસ્તારોમાં સંતુલિત માનવ વિકાસ માટે પ્રવૃત્તિ વિકસાવવાનાં CSI નાં પ્રયાસોને લીધે આ સંશોધન એક ફિલ્ડ પ્રોજેક્ટમાં પરિણમ્યું.

ASSBY ની માનવ સમૂહ અને નિવસનતંત્ર પર સામાજિક, સાંસ્કૃતિક, આર્થિક અને પર્યાવરણને લગતી અસરો ચકાસવી એ આ પ્રોજેક્ટનો શરૂઆતનો હેતુ હતો. આ પહેલાં વિવિધ શાખાઓને સાંકળતી કોઈ સંકલિત અભ્યાસ કાથ ધરાયો ન હોવાથી ASSBY પહેલાં અને પછીની પરિસ્થિતિની સરખામણી કરવાની ખૂબ ઓછી તક મળી હતી. આ અભ્યાસમાં વનસ્પતિ, પક્ષીઓ અને જળસ્ત્રોતની સાથે સાથે વિકાસની આર્થિક, સામાજિક અને સાંસ્કૃતિક અસરોનું પણ વિશ્લેષણ કરવામાં આવ્યું હતું. આ ઉપરાંત જળ સ્ત્રોત અને સંગ્રાહન પરનું કામ ૨૦૦૨નાં મધ્યમાં પૂર્ણ કરાયું હતું.

જેમાં ઘણા સંકળાપેલા લોકોએ ભાગ લીધો હતો એવા જુલાઈ ૨૦૦૨માં ભાવનગર ખાતે યોજાયેલ વર્કશોપ બાદ ફિલ્ડ પ્રોજેક્ટ માટે ફરી થી સંકળાપેલા મુખ્ય જુથોને અને

ASSBY ને લગતા પ્રશ્નો પર પુનઃવિચારણા કરવામાં આવી ત્યારપછી વ્યક્તિગત સંપર્ક દ્વારા મુખ્ય જૂથો-ગ્રામ્ય લોકો, સ્થળાંતરિત કારીગરો, શીપબ્રેકર્સ અને ઘ મુજરાત મેરીટાઇમ બોર્ડ મે ૨૦૦૧ અને ઓક્ટોબર ૨૦૦૩માં ફી વર્કશોપમાં મળ્યા.

પરિણામ સ્વરૂપે પ્રોજેક્ટ પ્રવૃત્તિ દ્વારા પર્યાવરણના પ્રદૂષણ, આસૈન્ય અને કાર્યની પરિસ્થિતિની કથળેલી સ્થિતિ, જીવન જરૂરિયાતનાં પ્રાથમિક સાધનોનાં પ્રશ્નોને વધુ સમજ શકવા છે. અને સુધારો આવી શક્યો છે. મતભેદનું નિરાકરણ લાવવા લોકોને ચર્ચામાં ભાગ લેવા પ્રેરિત કરવા એ સફળતાની ચાવી છે. બધાજ સમૂહોએ પ્રશ્નોને ઉઠેશવાની તૈયારી દર્શાવી છે. જાગૃતિ, અભિગમમાં પરિવર્તન અને ખાસ કાર્યને કંઈક અસર પાડી છે. જે કે ઠજી ઘણા પ્રયાસો કરવાની જરૂર છે.

એક એવા સંચાર માધ્યમને તૈયાર કરવું કે જે નિયમિત રીતે જૂથોને પરસ્પર નિસ્ખલ ઘરાવતા મુદ્દે ચર્ચા કરવા, તેનાં નિરાકરણ માટે સંમતિ મેળવવા અને તેને અમલમાં મૂકવા સાથે લાવી શકે એ કોઈ પણ સામૂહિક અભિપ્રાય પ્રક્રિયા માટે સૌથી મોટો પડકાર છે. શીપબ્રેકિંગ નફાલક્ષી ઉદ્યોગ છે અને તેથી સંકળાયેલા જૂથો ખાસ કરીને શીપબ્રેકિંગનાં રસ અને વર્તનનું નિયમન કરવામાં આ વેપારમાં ઉત્તર ચઢાવ સૌથી વધુ અસરકારક છે. આ બાબતનો ઉપયોગ કોઈ સીતે પ્રોજેક્ટનાં ઠેતુઓ વધુ સફળ બનાવવામાં કરી શકાય તેવા પર ધ્યાન આપવાની જરૂર છે.

AGAINST A RICH HISTORICAL BACKGROUND OF MARITIME COMMERCE, THE STATE OF GUJARAT ON THE NORTH-WEST COAST OF INDIA IS HOME TO THE ALANG-SOSIYA SHIP-BREAKING YARD, ONE OF THE LARGEST SHIP-BREAKING FACILITIES IN ASIA. THIS HUGE INDUSTRIAL OPERATION WAS ESTABLISHED IN 1983 AND HAS GROWN TO BECOME ONE OF THE MOST IMPORTANT INDUSTRIES IN THE STATE.

# Introduction



I nevitably an undertaking of this magnitude in a sensitive coastal area has generated a variety of problems – social, cultural, environmental, economic and political. Ways to develop a framework to solve and mitigate some of these problems lie at the core of the project undertaken by the United Nations Educational, Scientific and Cultural Organization (UNESCO) and are the subject of this publication.

### **Environment and Development in Coastal Regions and in Small Islands platform**

In 1996, UNESCO established the Environment and Development in Coastal Regions and in Small Islands (CSI) platform. The overall objective of the CSI platform is to contribute to the development of an interdisciplinary and integrated approach to the prevention and resolution of conflicts over resources and values in coastal regions and small islands.

Three modalities lie at the core of the CSI approach:

- Field-based projects provide a framework for collaborative action on the ground and represent the building blocks of the endeavour.
- University chairs and twinning networks provide for intersectoral training, awareness and capacity building, and also support the field project activities.
- A multi-lingual, internet-based discussion forum on ‘Wise Coastal Practices for Sustainable Human Development’, builds on the experiences of the field projects and the university chairs/twinning arrangements, to formulate, test and disseminate wise practice concepts in a global perspective.

The field project at the Alang-Sosiya Ship-Breaking Yard has proven to be particularly challenging. Not only does it bring to the fore a number of

social and environmental issues, but it also involves a diverse range of interests and stakeholders, who all share an economic interest in the sustainable development of the yard, yet have vastly different means and abilities to influence that development. How to bring these stakeholders together to address their individual concerns has emerged and been developed as a critical new operational modality for CSI.

### Project activities

The initial phase of the project commenced in 1999 with field studies of the socio-economic and biophysical conditions of the villages lying within a 12 km radius of ASSBY. Comparative studies were conducted to evaluate changes in the lifestyles of local village inhabitants under the influence of ship-breaking and associated downstream industries, as well as changes in local social organization brought about by the influx of heterogeneous groups of workers to the coastal area.

The first phase also surveyed and mapped natural resource stocks (including flora, fauna and water) in the ASSBY area. Using old records and oral traditional knowledge of the local residents, changes and trends in natural resource availability during the 1970s and 1980s were assessed. It was on this basis that some of the impacts of the ship-breaking yard on the natural resource system could be determined. The study team then proposed measures to conserve natural resources and biodiversity for locally appropriate sustainable development.

It was recognized after the first phase of activities that in order to further develop the project there were two key issues that needed to be addressed: water quality and supply and the migrant worker population. A workshop was held in July 2000 that brought together local experts from research institutions, government agencies, non-governmental organizations (NGOs) and the private sector as well as local stakeholders themselves. During discussions held over two days, it

was agreed that in order to fully understand the problems raised during the first phase, it was necessary to refocus the project by clearly identifying and consulting with the major stakeholders: the villagers, migrant workers, ship-breakers and the Gujarat Maritime Board.

The second phase of the project culminated in a multi-stakeholder consultation and review workshop in 2001. Preparation for this workshop involved extensive consultations held by the Bhavnagar University project team with individuals, groups and representatives of each of the four main stakeholder groups. These groups were profiled and their major issues and concerns were summarized. There are a host of critical concerns that lie at the core of sustainable development at ASSBY:

- environmental pollution
- depletion of water resources
- land use
- health
- education
- living and working conditions of the workers
- social tensions between the immigrant workers and the local residents
- economic instability and insecurity of the ship-breaking industry largely due to competition from south and south-east Asian ship-breaking yards.

Understanding these issues and how the different stakeholders perceive them provides the foundation for developing wise practices to mitigate negative social and environmental impacts. Furthermore, this paves the way to establish a mechanism through which the stakeholders can maintain an open dialogue. Indeed, it is through the

Research team leaders, Harishchandra Dube (centre) and Vidyut Joshi (right), with ship-breaking workers





Ship-breaking plots stretching along the coast at ASSBY

development of this phase that the project began to suggest itself as a suitable ground to test the application of a multi-stakeholder agreement. Such an agreement will necessarily be discussed, shaped and revised through ongoing dialogue and negotiation.

Annex I contains a summary of the project, while an assessment of the project conducted in December 2001 is included in Annex II. Annex III contains a list of all relevant articles that have been posted to the CSI Wise Coastal Practices for Sustainable Human Development web-based discussion forum.

### **Background to the Alang-Sosiya Ship-Breaking Yard**

Gujarat has a long and colourful history of maritime commerce that stretches back almost 3,000 years. During this period Gujarat was in contact with China, Egypt, Sumatra, Sri Lanka, Madagascar,

Arabia and even Greece. The many ports which dotted its coast rose and fell in importance as the centuries went by and were renowned for ship-building. Today, however, the villages of Alang and Sosiya on the Gulf of Khambhat have become the focus of considerable activity and attention, not for building ships, but for breaking and recycling them.

Gujarat is rapidly becoming one of the most industrialized states in India. The coastal industrial belt of south Gujarat, referred to as the 'Golden Corridor', has already reached saturation point in terms of industrial development as well as pollution. Attention is now turning to the coastal regions in the peninsular (Saurashtra) region of the State, regarded as a potential 'Silver Corridor'. Certain forecasts suggest that by 2025, 60% of industry and the equivalent percentage of the State's population will be located along the coasts. Hence it is pertinent that mistakes of the

past are not repeated and that sustainable development is accorded due priority when planning for industrialization of the coastal regions. One of the first major industrial developments along the Saurashtra coast of peninsular Gujarat was the Alang-Sosiya Ship-Breaking Yard where operations officially commenced with the beaching of the M.V. *Kota Tenjong* on February 13, 1983.

The coastal village of Alang was selected as the site for India's second large-scale ship-breaking yard (after Mumbai) as a result of specific policy decisions by the Central Indian and Gujarat State governments. In 1978, the Central government adopted a policy of importing ships ready for scrapping by the Metal Scrap Trade Corporation and created a 'ship-breaking development fund' for this purpose. In order to diversify ship-breaking activity away from Mumbai, a number of studies were carried out in the early 1980s by the Metal Scrap Trade Corporation and the Gujarat State government. In 1982, representatives of the ship-breaking industry joined government officials in a detailed study of the coasts. Alang, located 56 km south of the city of Bhavnagar, was identified as a suitable site for beaching very heavy ships, given its continental shelf, high tidal range (around 10 metres) and comparatively mud-free conditions.

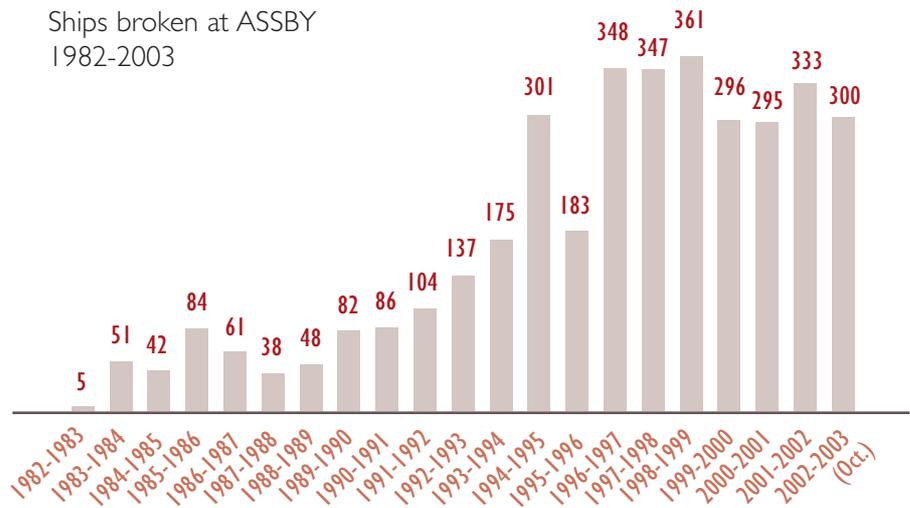
The Gujarat Maritime Board was then given the job of installing and arranging for the necessary infrastructure: acquisition of land, planning and allotment of plots to ship-breakers and the provision of water, electricity, roads and communications.

ASSBY is the one of the largest ship-breaking facilities in Asia. At the peak of operations at the yard there have been as many as 100 plots in operation serviced by an estimated 25–30,000 workers, the majority of them migrants. There have been more than 3,677 vessels broken at the yard since operations began representing over 27 million LDT (light displacement tonnage – the net weight used to calculate scrap value). The iron and steel recovered from the ship-breaking activities account for an estimated 10–15% of India's steel production. Important downstream industries have developed including re-rolling mills, foundries, oxygen plants, transport and recycling and resale of a wide range of items, from turbine engines to washbasins and armchairs. At its height, during the mid-late 1990s, the iron and steel industry combined with secondary activities was estimated to be worth in excess of US\$ 500 million per annum contributing significantly to the revenues earned by the Gujarat Maritime Board and the State government from this industry.

Material being sorted for sale in recycling shops ('khadas')



Ships broken at ASSBY  
1982-2003



### Ship-breaking processes

There is a growing trade in the scrapping of ships that is directly related to the continuing growth of the shipping industry. The working life of the average ocean-going vessel is approximately 30 years. The costs of ship-breaking have increased in those countries where strict standards and guidelines for working conditions and the disposal of waste are enforced. In the last few decades there has been a relocation of the industry from the USA and Europe to Asian countries such as India, Bangladesh, China, Pakistan and the Philippines where the costs of ship-breaking are much lower.

The global trade of ships to be broken continues to expand as the International Maritime Organization steps up the phase out of single hull oil tankers. In 1992 the Basel Convention came into force at the instigation of the United Nations Environment Programme (UNEP) with the express aim to minimize the generation and transboundary movement of hazardous waste. The ship-breaking industry has long been targeted as a violator of the Convention. After intense lobby-

ing by international NGOs, such as Greenpeace and the Basel Action Network, the 6th Convention of the Parties adopted technical guidelines for the environmentally-sound management of the dismantling of ships in 2002. However, the responsibilities of ship owners and ship-breaking countries need to be further clarified.

Each leased plot at ASSBY employs between 150–200 workers and towards the end of 2003 there were around 15,000 workers employed in approximately 80 working plots. Over 90% of the total labourers engaged at ASSBY are migrants, who come seeking better employment opportunities than those available in their home states.

According to an experienced ship-breaker, ships are purchased directly over the telephone or internet, or through a brokerage service usually located in India or London. The ship-breaker tries to get the best possible return on the investment by breaking the ship as efficiently as possible. Important considerations, besides the price, include the weight of the ship, where it was built and

the purpose for which it was used. For example, breaking a Russian ship entails 'high-weight loss' because there is no market in which to re-sell Russian equipment. Ships constructed in the USA give the highest return in terms of the quality and value of steel recovered but are more expensive to purchase, whereas ships from Japan are the cheapest and quickest vessels to break. The resale value of equipment recovered is not to be underestimated and entire engines are often resold and converted into 5 Megawatt power plants for 15% of the cost of a new one. In the immediate district of Bhavnagar alone there are over 100 steel re-rolling mills catering to the steel recovered from the ships. The preferred vessels broken at ASSBY are bulk cargo carriers, tankers and car carriers.

Prior to beaching a ship at ASSBY, several teams simultaneously inspect the vessel. Of most importance, in line with government regulations, is the inspection for hazardous materials and residues by a government approved technician. Other teams from the plot where the ship is to be broken, including a non-ferrous metal dismantler, inspect the vessel to assess the best way to break it. Once the vessel is approved for beaching by the Gujarat Maritime Board and the tide is right, the pilot brings the ship at full speed onto the shore in front of the appropriate plot. Between 5–10% of the ships that arrive at ASSBY are towed as their engines no longer function (dead vessels).

At present, the technology used in the ship-breaking process is relatively simple and labour intensive. The breaking of one ship requires an average four to five months and

is mainly achieved through manual effort. The ship is stripped entirely and then cut into sections using oxygen torches. Cranes are used for loading and unloading of heavy machinery and periodically dragging the ship further up the shore. The average working hours are from 8.00 a.m. to 6.30 p.m., six days per week. During the two highest tides of the month, at the full and new moon, the ship is dragged further up the beach by cranes as it gradually becomes lighter and smaller.

According to the ship-breakers, one of the impediments facing the introduction of new technology and associated work practices at the yard is the international pressure to ban the export of ships containing toxic substances to Asian countries. They argue that this makes large-scale capital investment unlikely. The possible loss of jobs is also a serious concern in India where there is an urgent need for employment opportunities.

The impact of the ship-breaking process on the environment has

been widely publicized. The ship-breaking procedure creates pollution of land, sea and air. Toxic fumes are produced by the process itself as well as from fires that burn non-recyclable waste materials. Due to improper disposal of solid waste, animals, crops and the ground water aquifers are affected. Noise pollution due to heavy traffic in the local area is another impact of the industry. By far the greatest concern according to NGOs is the disposal of PCBs (poly-chlorinated biphenyls), heavy metals and carcinogens such as asbestos. This was the subject of a highly publicized protest off the coast of the yard in 1999, designed to draw attention to the need for mandatory decontamination of vessels carrying toxic waste, prior to their transportation to the ship-breaking sites. There has been some recent progress at ASSBY such as the issuing of gas-free inspection certificates before the ship is beached to ensure safety for the workers during the torch cutting process. Nevertheless, numerous serious social and environmental challenges remain to be

Half-broken ship being prepared to be dragged further onshore



addressed and the lack of effective enforcement of local regulations for ship-breaking is also of concern.

### Stakeholders

There are four major stakeholder groups located within the study area. These are the villagers, ship-breakers, migrant workers and the Gujarat government represented by the Gujarat Maritime Board. The study area was defined as a zone within a radius of 12 km of Alang village, which lies at the heart of the present day ship-breaking activities. In 1961, this area contained ten villages whose residents depended on subsistence agriculture and cattle herding. Almost everybody worked in the fields. The 1961 census put the total population of the ten villages at roughly 7–8,000. Thirty years later, the 1991 census indicated that the population of the area had grown to almost 20,000. The most recent estimate by the

project team in 2002 found the combined total population of the yard and the ten villages to be in excess of 60,000 people.

The study area falls within a zone that has been identified as under-developed both socially and economically. Caste and gender traditionally had, and continue to have, a strong influence on economic, social and cultural activity. Prior to 1982, education and literacy levels were very low. Increased movement of people into the area has resulted in an increase in land prices; within a 15 km radius of ASSBY, land prices are reported to have increased up to 100 times compared with pre-ASSBY times. Not surprisingly, a growing number of villagers have sold their land and changed their professions.

ASSBY has had profound impacts on the social, political, economic and cultural aspects of the local

society. Immediately obvious are changes and improvement to the material quality of life and income generation, yet there have also been considerable changes in marriage patterns, employment, inter-caste relations, religious practices and education. There has also been a rise in theft, illegal sale of liquor, and prostitution which is of concern to the local residents. Some of these issues have been discussed on the Wise Coastal Practices for Sustainable Human Development internet-based forum; see Annex III for a list of the relevant articles.

### Villagers

The ten principle villages in the vicinity of ASSBY are Alang, Sosiya, Manar, Sathara, Kathava, Bharapara, Mathavda, Takhatgadh (also known as Chopada), Jaspara and Mandva. All are very close to the seashore and lie within a radius of 12 km from the centre of ASSBY.

## The Indian Caste System

Adapted from O'Malley (1934)

The Hindu community is divided into four major castes: Brahmins, kshatriyas, vaishyas and shudras, which are further divided into over 2,000 sub-castes, groups or classes arranged in a complex system of social delineation. Certain qualities were believed to be inherent to each caste: peacefulness, self-control, austerity, purity, tolerance, honesty, knowledge, wisdom and religiousness are attributed to the brahmins, who were supposed to work as temple priests, teachers and advisors; heroism, power, determination, resourcefulness, courage in battle, generosity and leadership are the natural qualities of work for the kshatriyas – kings and soldiers belonged to this caste; farming, livestock rearing and business were the natural work for the vaishyas; and for the shudras there was labor and service to others. All the so called 'backward' classes of India belong to the 'shudra' caste. Members of this caste normally follow 'less respectable' jobs such as cobblers, tanners, barbers, black smiths, garbage collectors and sewage cleaners. These were the beliefs and trends in the ancient times. Over the years, however, the caste system has become much more flexible.

The caste system is hereditary, with each member being born into a certain caste. Between its members, a caste is a bond of union, but the system splits up society into sections which, owing to the prohibitions not only against inter-marriage but also against eating and/or drinking together, prevent social fusion more perhaps than any other institution in the world. However, over the years, the social restrictions have eroded and there is greater social intermingling among the so called 'higher castes'. However inter-caste marriages are still not very common, especially in the rural areas.

The vast majority of the population of these villages (except Jaspara, where the majority are Kshatriya or Rajputs) are members of the Koli caste, a socially and educationally disadvantaged group. Paleval (sub-caste of Brahmin), Garasia (sub-caste of Kshatriya) and Kharak (agriculturist, sub-caste of Sudra) are three other significant castes in these villages. The villages are part of Talaja taluka. A taluka is a state electoral subdivision of a district. All of the above villages, including Alang and Sosiya, are administratively in Talaja taluka of Bhavnagar District.

Before the advent of ship-breaking activities, most of the villagers were involved in agriculture and animal husbandry, with a small sea-faring minority engaged in fishing and allied activities such as net mending and boat building. Since the establishment of ASSBY, local people have witnessed extensive socio-economic and environmental changes. Although very few members of the local population work directly in the yard dismantling ships, many are involved in ancillary activities and businesses including tea shops, pan galas (wooden push carts selling goods), sundry provisions, snack stalls and other such small enterprises. There are in excess of 400 scrap goods shops – or 'khadas', that resell items recovered from the ships. Most of these khadas are owned by villagers, particularly those of Kharak and Paleval castes. Kshatriya have pursued opportunities in transportation. Some villagers rent accommodation whilst others (mostly women belonging to 'lower' castes) are engaged in prostitution servicing the mainly single migrant workers. Of late, prostitution has become a growing trade with truck loads of 'mobile/migrant' prostitutes period-



Consultation with villagers, Jaspara

ically providing their services to the migrant labourers.

There is a strong belief amongst the majority of the local people that the developments and changes arising from the establishment of ASSBY represent unique opportunities that should be exploited while they are still available. Yet according to the villagers, the changes brought about by the ship-breaking industry have not been without environmental costs. Depletion of fuel wood and water resources is of major concern. Agriculture was a viable industry in the past, with onions as the major crop, and cattle herding was also important. Agriculture and animal husbandry have deteriorated and the milk and onion-growers cooperatives are no longer in business. One reason for this is the depletion of water resources. Not only has the level of the water table dropped from 15 metres to 130 metres in the last 20 years, but water quality has declined because of saline intrusion. *Prosopis juliflora* (Gando baval, an

exotic weed) is the only remaining fuel wood readily available in the villages. Given this scarcity, the villagers have turned to more expensive kerosene and liquid petroleum products for their energy needs.

### Ship-breakers

The ship-breakers are entrepreneurs and business people who supply capital and manage the activities at the yard, starting from the moment of purchase until the last steel plate is sold and driven away from their plot. The plots at ASSBY are allotted by the Gujarat Maritime Board to ship-breakers and these plots are most often run as family businesses, many of which are based in Mumbai. Many of these entrepreneurs are first generation ship-breakers and most have learnt the business through trial and error at ASSBY.

Due to the nature of the industry and the lack of training provided at all employment levels, ship-break-



Tea break at one of the larger plots

ing is conducted with little application of scientific and technical knowledge, and the minimum of environmental and safety standards. The ship-breaking industry has been organized into a Gujarat Ship-Breakers Association to lobby for the long-term security of the industry.

A major concern for the ship-breakers is the fact that they have to pay 15% customs duty and 16% excise duty which is quite high compared to the 5% of each tax levied in Pakistan and Bangladesh. Environmental pollution, health and safety hazards and lack of potable water are also of direct concern to most of the stakeholders. The ship-breakers need to be further encouraged to take a greater share of responsibility for the sustainable development of ASSBY and to be more responsive to the concerns of the villagers and the large numbers of migrant workers.

## Workers

There are 11 recognized categories of work existing in the ship-breaking plots:

- Jodiwala – workers who move the heavy iron plates from one place to another
- Battiwala – workers who cut the ship with oxygen torches powered by liquid petroleum gas cylinders
- Helpers who primarily assist the Battiwala and in all other duties as required
- Common labourers
- Mukadam – contractors who function as leaders and place workers at appropriate stations
- Supervisors
- Winch operators
- Crane drivers
- Fitters
- Carpenters
- Foremen

The workforce is comprised almost entirely of a migrant labour pool from some of the most underdevel-

oped north Indian states, namely Bihar, Orissa, eastern Uttar Pradesh and Madhya Pradesh. There are also a substantial number of people working in ancillary activities who are from Gujarat. Approximately 80% of the migrant workers are illiterate. Since they are migrants and relatively young in age, almost 70% of them stay within ASSBY in rented shanty dwellings usually without adequate facilities for potable water, electricity and drainage systems. The workers' monthly income from ship-breaking activities ranges from a low Rs. 2,100 (US\$ 50 approx.) for a first-time helper, to Rs. 9,000 (US\$ 200 approx.) for a plot supervisor/foreman, with an average of Rs. 3,000 (US\$ 65 approx.) for an experienced but unskilled worker. By Indian standards the average wages are quite good for such manual and hazardous work and help to explain the attraction of employment at ASSBY.

Adequate living conditions are the primary concern of the migrant

Common labourers at ASSBY



workers. Other concerns include wages, and safe, healthy and standardized working conditions. They are acutely aware that their working and living conditions result in illnesses such as diarrhoea, jaundice, stomach pain, tuberculosis, fever and skin diseases, and cause work accidents which are sometimes lethal. In addition, being away from their family, there is a high indulgence in unsafe sex exposing them to HIV and venereal diseases. According to a 1998 report published by the Bhavnagar Blood Bank, increasing numbers of cases of sexually transmitted diseases, HIV, tuberculosis and hydrocil (enlargement of the testicles largely due to physical injury common among labourers who do hard menial jobs without proper protection to their genitals) were detected among the labourers.

### **Government (Gujarat Maritime Board)**

The Gujarat Maritime Board is the coastal zone authority of the Government of Gujarat and manages the affairs of ASSBY and all the ports except Kandla. The Board is responsible for designing a system to ensure work safety. Considering the industry is highly unorganized, safety measures required by the Factories Act (1948 – Second amendment 1987) are not being implemented. The Gandhi Labour Institute of the Government of Gujarat has carried out a survey of safety at ASSBY and has laid down safety standards for both work place practices and waste disposal.

Clearly if the industry is to be properly regulated and made sustainable there is a need for spatial planning. This would include physical infrastructure such as roads, housing, drainage, sewage disposal, water and

electricity; and social infrastructure like schools, hospitals, centres for entertainment and social gatherings, places of worship, and community services. The Gujarat Maritime Board is not structured for the provision of social and community infrastructure, nor are their officials trained in these areas.

The situation posed by unorganized working and living conditions also creates health hazards, not only for the workers, but also for Gujarat Maritime Board officials, plot lessees and the villagers. Environmental pollution is a shared concern for all stakeholders.

ASSBY HAS ATTRACTED MANY MEN, AND LATER WOMEN, TO JOBS THAT ARE YEAR-ROUND, BETTER PAID, REGULAR AND LESS ARDUOUS THAN WORK IN THE FIELDS. THE REPERCUSSIONS OF THIS LABOUR SHIFT HAVE BEEN FAR REACHING.

## Environment and social



## c h a n g e

**Biophysical context**

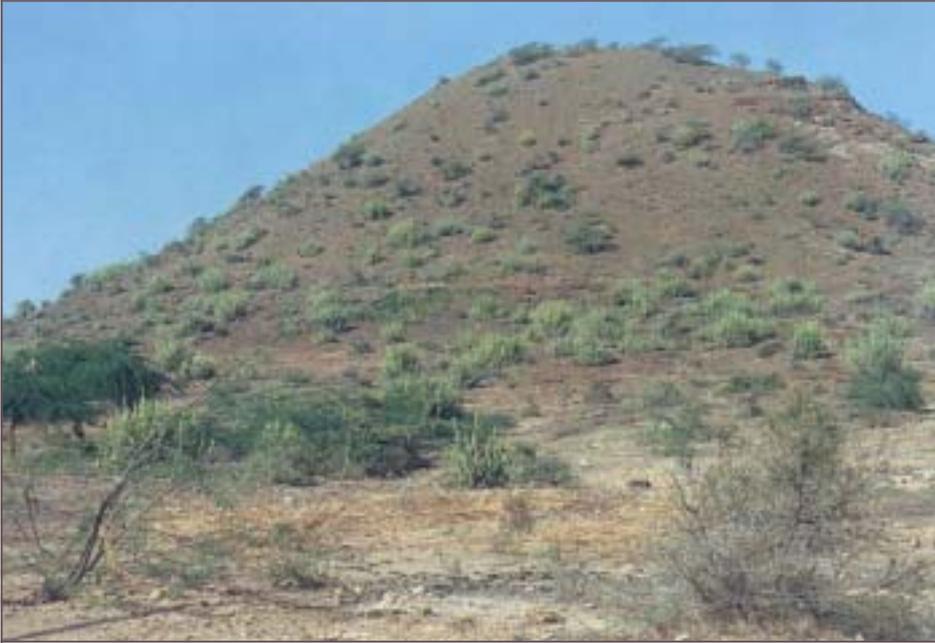
ASSBY is located on the Bhavnagar Gopnath segment of the Saurashtra coast which forms the western flank of the Gulf of Khambhat (see map inside the front cover). This Gulf forms a funnel shaped entrance to the Arabian Sea sandwiched between mainland Gujarat and the Saurashtra peninsula. It opens up into the Arabian Sea rather abruptly and is located at the widest part of the west coast's continental shelf. The Gulf is 50 km in its widest part along its southern limit and is approximately 135 km long in the north-south direction.

ASSBY lies within a semi-arid, drought prone, coastal zone of saline soils. The region has an average annual rainfall of 558 mm; the mean highest and lowest temperatures are 34.2° C and 21.9° C respectively. The natural vegetation is classified as semi-arid scrub forest. The study area within a 12 km radius of Alang comprises 239.15 ha of forest, 801.55 ha of cultivable lands and 497.49 ha of land unsuitable for agricultural purposes.

The coastal alluvial soils consist of bentonite clay soils (an absorptive and colloidal clay used as a bond for sand, asbestos and other industrial applications including manufacture of paper, soap, pharmaceuticals and altering the viscosity of oil) and deep black soils. The bentonite clay soils lack a porous subsurface layer, are susceptible to water logging and salinity, and have high lime impregnation. All these factors render them unproductive for agriculture. Closer to the coast the soils are deep, dark grey-brown, fine in texture, slowly permeable and subject to tidal action.

The area as a whole faces problems common to most of the coastal areas of Saurashtra. These include low soil fertility, increasing soil salinity, scanty vegetation cover, soil erosion, scarcity of fresh water, overgrazing and over-exploitation of fuel wood, depletion of fish stocks due to mangrove destruction, and discharge of industrial waste into the sea.

A report by Greenpeace (Kanthak *et al.*, 1998) reported high levels of heavy metals and toxic organic compounds in marine sediments and soil samples



Typical landscape of semi-arid scrub vegetation in study area

taken from ASSBY. In addition, hazardous solid waste materials, like asbestos from the ships, is indiscriminately discarded and sold in the open market near ASSBY. Farmers in the area have been known to use the discarded asbestos as fencing materials for their fields. Asbestos is used for both insulation and as a fire resistant material; however, its dust causes the formation of scar-like tissue in the lungs, resulting in permanent breathing difficulties, and in the long term, lung cancer and cancer of the thin membrane around the lungs. The proper disposal of asbestos, as well as other materials such as oil waste, thinners and other chemicals, solvents, epoxy resins, antifreeze fluids and polycyclic aromatic hydrocarbon compounds, is extremely important.

An interdisciplinary team from the Bhavnagar University collected and analysed data on plant, wildlife and water resources in the study area over a 12-month period from

February 1999 to January 2000. This survey was designed to determine the impact of ASSBY and associated industries on the natural resources of the area and to identify preliminary wise practices.

### Water

The coastline in the study area forms a narrow north-northeast/south-southwest trending coastal plain, backed by low ridges. This plain is crossed by several small rivers and seasonal streams which are shallow and less than 50 km in length. Due to their seasonal nature, these rivers and streams are not reliable sources of water for human consumption, irrigation or other uses.

Despite the severe restriction on available drinking water faced by coastal villages in the Gulf of Khambhat, no serious attempt has been made to evaluate ground and fresh water conditions within the area. The ground water in all

coastal segments of the Gulf is saline and sweet water supply is limited and restricted to very shallow water table type unconfined aquifers (Islam, 1986).

All of the area's rivers and ponds are polluted to some degree by human activities, which include the washing of clothes and utensils, bathing, and the washing of cattle and vehicles (tractors, rickshaws, trucks etc.). Sathara village pond and the streams at Alang, Sosiya and Mandva are also used for discharge of waste water from the villages.

Water quality sample sites were chosen based on the different uses being made of the water (domestic, agricultural, industrial) and water sources (well, bore, lake, pond or irrigation canal). The permissible limits of various water quality parameters, mainly for drinking and agricultural use, were analysed in accordance with standards from the World Health Organization, American Public Health Association, and Indian Standards Institution. The conclusion was that water resources in the village wells had no contaminants, such as hydrocarbons or heavy metals, that could be directly correlated to the ship-breaking activities. However, there was a certain degree of saline intrusion.

Workers use the village pond at Bharapara and water available at the plots for washing and cleaning. The pond is visited by as many as 30 species of water birds during the year. At ASSBY itself, drinking water is brought in by the port authorities via tankers from the village of Manar.

A follow-up study of the economic aspects of water resource manage-

ment in the ASSBY area was completed in 2002 with the support of UNESCO's International Hydrological Programme (Dube, 2002). It is estimated that 85% of the rainfall is not recovered in the Saurashtra region. An analysis of water supply revealed that surface water in dams is the most important source providing 14 million cubic metres, as opposed to only 4.5 million cubic metres supplied by ground water discharge from bores, wells and springs. An in-depth analysis of water demand for domestic, animal, irrigation and industrial uses revealed that the combined demand for water in the ASSBY villages is 46 million cubic metres, which is far in excess of supply. The Gujarat Maritime Board has taken steps to assist several villages in improving their water supply with pipelines. However, the overall water shortfall signals a need for a co-ordinated response to water resource management.

### Flora

The increased economic activity and prosperity brought about by ASSBY has been matched by a corresponding increase in the demand for land. More and more villagers have begun to convert their dwellings into larger concrete structures, leading to encroachment on community grazing lands, and increased pressure on those plants used for fuel wood and fodder. This has caused demand for fuel wood and fodder to exceed supply.

In the absence of any prior baseline data, the study was not able to determine whether the presence of ASSBY had had a significant effect on the flora. Although it was noted that there were very few plant species at Alang and Sosiya, the

two villages where ASSBY activities had heavily encroached. A one-year study of the vegetation was conducted and primarily focused on the uses of various plants in the day-to-day lives of the villagers.

Mangroves buffer the destructive power of cyclones and other storms, thus reducing coastal erosion. They are the feeding and breeding habitats for a large number of commercially important fish and marine organisms. They are also the nesting sites for a large number of water birds. In the Saurashtra and Kutch regions of Gujarat, mangroves are a vital source of fodder for the migratory camel herders (Jats). Mangroves have numerous uses such as fuel wood, fodder, green manure, boat building, fish traps and fishing floats, tannin for the preservation of fishing nets, raw material for paper production, food, drugs, honey, beverages and household items.

The Gujarat Forest Department has successfully regenerated mangroves along the coasts of Kutch and Ghogha (near Bhavnagar) and this practice could be extended to the mangrove fringes of ASSBY by the Departments' Social Forestry section.

There are a number of plants growing in the study area which are considered to be 'weeds' yet are also used for fodder. Fifty weed species found to be commonly growing in the study area were selected for detailed investigation regarding their use as food, fodder and medicine by the local communities. Leguminous plants like *Crotalaria* (Ranmethi), *Taverniera* (Jethimal) and *Alysicarpus* (Khadsamervo) are a rich source of protein for both livestock and humans. Some of the local plants belonging to other fam-

ilies like *Digera* (Kanjaro) and *Phyllanthus* (Kanochha), are quite hardy and a source of fodder for the free-grazing cattle. These plants, along with some hardy fodder grasses like *Dicanthium annulatum* (Zhinzhvo), *Sehima nervosum* (Shaniyar) and *Heterogon contortus* (Kagadiyoo), can be planted in the village grazing lands.

The presence of one particular weed, *Parthenium hysterophorus* (Congress grass), which is rarely found in remaining parts of Saurashtra, can be attributed to ASSBY. Its abundant presence around ASSBY implies that the seeds of this exotic weed have invaded this area either through ships coming to ASSBY or through the belongings of migratory workers. If left unchecked, this weed may pose a health hazard as it can trigger off skin allergies in humans.

*Prosopis juliflora* (Gando baval) is an exotic weed which grows abundantly in the study area. It has encroached onto village grazing

*Calatropis procera* grows as a common weed





Black-winged Stilt near Bharapara pond

lands and fields and has spread in all parts of Saurashtra and Kutch. This plant has the ability to thrive in saline and drought prone areas. It produces good quality gum, honey and charcoal. Its pods are rich in sugar and protein. An NGO based in Kutch has been using this plant for large-scale production of gum, honey, charcoal and cattle feed from its pod. This project has also been a source of income generation for the local residents. The tree has also been used for the biological desalination of saline wastelands.

There are also hardy, drought resistant, multipurpose tree species like *Acacia nilotica* (Desi babul), *Prosopis cineraria* (Khijado) and *Acacia senegal* (Gorad), as well as salt tolerant species like *Casuarina* in the area. All of these tree species can also be utilized as sources of major and minor forest products like gum, tannin, fuel wood and fodder. The presence of tall trees in the agricultural fields invites large birds of prey such as eagles and kites, directly

benefiting farmers by preying upon insect pests and rodents.

A number of the local plant species such as *Calotropis*, *Capparis* and *Balanites* are used by local communities and Vaidas (traditional healers) to cure various ailments. Strong traditions revolve around these plants and their medicinal properties are relayed by folklore and songs. However, because of the immense pressure on the local vegetation for fuel, wood and fodder, some of these medicinally important plants are becoming rare along with the knowledge of their uses.

### Waterfowl

Water birds and their habitats were chosen for the study primarily because both their aquatic habitats and their migratory patterns are very sensitive to changes in the environment and might therefore be an indicator of the impact of ASSBY.

The study area comprised eight village ponds and three seasonal streams, all of which are visited by resident and migratory birds. Since there were no pre-ASSBY surveys, the results provide valuable base-

line information. A year-round census of water birds was carried out and detailed observations were made on the following aspects:

- Location, size and characteristics of water bodies in the study area
- Identification and inventory of bird species at the water bodies
- Impact of the bird populations on the local communities
- Impact of human activities on bird populations and habitats
- Impact of ASSBY on the aquatic bird populations and their habitats

Prior to the establishment of ASSBY, the Alang coast supported rich coastal vegetation, including mangroves. This, along with the coastal morphology of the area, provided an ideal habitat for a variety of resident and migratory water birds. These birds are also attracted further inland to the various village ponds for roosting and foraging.

A large number of the water birds in the study area, e.g. the Little Grebe, Black-winged Stilt and Black Ibis, feed on insects and some, like White Ibis, Painted Stork and Cattle Egret, feed on rodents. These birds help in controlling the popu-

Village	Number of waterfowl species recorded 1999–2000
Bharapara	30
Mathadawa	29
Jaspara	26
Sathara	22
Manar	20
Sosiya	12
Mandva	8
Alang	6
Kathava	No consistent sightings
Takhatgadhd	No consistent sightings

lation of various pests, which are a threat to farmers' fields and crops. Some birds help check the spread of malaria and aquatic weeds.

ASSBY appears to have had a direct impact in terms of species and numbers of water birds in the surrounding villages of Alang, Mandva and Sosiya. In addition, various types of pollutants, e.g. oils and heavy metals from paints, spill into the sea and have had an adverse impact by restricting the breeding, feeding and roosting grounds of some water birds (depending on their migratory patterns) in the vicinity of ASSBY. There is no hard evidence to indicate that the ship-breaking yard has had an appreciable effect on ponds, rivers and aquatic bird life beyond this immediate area. In fact, the study area as a whole shows high species diversity for waterfowl compared to the coast of southern Saurashtra, with a total of 42 different species belonging to ten families.

### Recommendations and preliminary wise practices for conservation

The following recommendations and preliminary wise practices for the conservation of soil, water, plant and wildlife resources in the area around ASSBY are also relevant for many other parts of India.

**1.** Develop water resources for the local people: All of the villages within the study area need adequate supplies of clean water for drinking and washing purposes. Ponds need to be deepened to increase water availability. Special emphasis must be given to the management of catchment areas of rivers and ponds, and traditional rainwater harvesting techniques should be



*Prosopis juliflora* - a much maligned exotic plant

reintroduced wherever possible. Further awareness-raising is needed among the local people regarding the adverse health effects of drinking contaminated water.

**2.** Undertake further studies of heavy metals and persistent organic pollutants in soil, water, plants and human tissue.

**3.** Propagate and popularize local plants used in indigenous medicine: Since modern health care facilities are far from adequate in the ASSBY region, the need to conserve medicinally important plants cannot be over emphasized. Encouraging women to grow and maintain some of these plants in their backyards, and upgrading womens' and native doctors' skills in preserving and processing herbs are recommended. The knowledge relating to these plants needs to be systematically documented and disseminated; at present it is scattered and limited to specific generations within certain communities.

**4.** Regenerate mangrove species: It is recommended that the Gujarat Forest Department, with its experience in mangrove regeneration, involve the local fishing and camel herder (Jat) communities in the conservation, regeneration and sustainable exploitation of mangroves in the study area. Once regenerated, the mangroves and other halophytic species can, not only protect and stabilize the coast, but also help in reducing the pollutants discharged into the sea by ASSBY's activities. This would also help to attract a greater number of waterfowl to the area.

**5.** Introduce wise management practices for grazing land and fodder exploitation: Introduce the concept of rotational grazing with the help of the Lok Bharati Agricultural School at Manar village, and train the livestock owners in the planting and sustainable exploitation of various good quality fodder species in their fields and community grazing lands. For example, a private indus-

trial group in Kutch has raised plantations of *Salvadora* species on saline wastelands. The seeds of these trees, which contain 30–40% non-edible oil, are periodically harvested and supplied to the mill owners who extract its oil and sell it to soap and detergent manufacturers as a substitute for coconut oil. Local people have been employed in the maintenance of these plantations and women are employed in the harvesting of the seeds. It is recommended that local communities, NGOs, the Forest Department and research institutes, such as the Bhavnagar-based Central Salt and Marine Chemicals Research Institute, be involved in a similar initiative in the study area.

**6.** Propagate native multipurpose tree species on village wastelands, grazing lands and fields: Form a tree-growers co-operative among the villagers, and with the assistance of the Forest Department, distribute seedlings of some of the hardy, drought resistant, multipurpose tree species like *Acacia nilotica* (Desi babul), *Prosopis cineraria* (Khijado) and *Acacia senegal* (Gorad) along with guidelines on planting and care of these tree species. In the coastal area, hardy salt tolerant tree species like *Casuarina*, can be grown as shelter belts along the field margins. The above mentioned tree species can also be utilized as major and minor sources of gum, tannin, fuel wood, fodder, etc. The presence of tall trees in the agricultural fields can reduce pests by providing a habitat for large birds of prey like eagles and kites. It is recommended that local communities and entrepreneurs be involved in these initiatives.

**7.** Eradicate undesirable exotic weed species.

**8.** Increase awareness about the uses of village ponds for waterfowl habitat.

### Socio-cultural context

As was the case with the environmental survey, there was little previous work with which to compare the socio-cultural study findings. Hence, it was necessary to rely heavily on information gathered through interviews with village elders, regarding the conditions prevailing in the study area prior to the coming of ASSBY. The work undertaken represents an important database which can also be used for future monitoring of other industrial developments which are planned for the coastal areas of Saurashtra. (Slightly different socio-economic and cultural circumstances prevail in other coastal parts of Gujarat.)

Of the 3,248 households identified in the 10 villages by the 1991 State government census, 485 households representing 3,053 individuals (women, men and children) were selected as subjects for the present study.

Data were collected on a wide range of socio-cultural indicators in the ten communities: standard of living, organization of village life, cultural features (including issues of caste and gender), marriage, politics, religion, health, education, inter-community relations, and relations between the local population and migrant workers at ASSBY.

### Pre-ASSBY lifestyle

Prior to the establishment of ASSBY, the vast majority of the population were engaged in rain-fed subsistence agriculture supplemented by limited irrigation and animal husbandry. Higher forms of agricultural technology had yet to make inroads in the area. The service sector was virtually non-existent, and the few shops were barely able to meet the needs of the population.

Social and business relations extended only a few tens of kilometres and the 'marriage circle', the area within which a son/daughter was likely to find a spouse, stretched

Herdsmen with his goats on the road to ASSBY



to a radius of merely 60 km. Marriage remained subject to some of the oldest traditions to be found in India, in terms of identification of a spouse, the provision of a dowry, adherence to the rules of caste, and all the other rituals associated with this important union. Where work was concerned, caste was pre-eminent in the determination of the types of employment a person could undertake. Although the area was mainly populated by the 'lower castes', the gap and traditional rules governing relations among different castes were strictly observed. Religion played a large role in village life, and frequent religious festivals brought neighbouring villages into contact. Individual and family prayers were a regular feature of daily life. Politics were in the hands of village elders, with the role of sarpanch (village head) generally passing from father to son. Women and youth had little or no voice in the political affairs of the village.

Different generations of a family lived under one roof and younger generations deferred to the elders for crucial decisions. Most houses were of the traditional kachha (clay, cow dung and thatch) variety, lacking any sort of modern amenities. Health care and education services were very basic. Health care was largely the domain of traditional doctors, medicines and religion. Primary schools were found in only eight of the ten villages prior to the advent of ASSBY. Girls were essentially excluded from education and the overall rate of literacy was very low.



Engine being repaired for re-sale at a khada

### Impact of ASSBY on village life

ASSBY has attracted many men, and later women, to jobs that are year-round, better paid, regular and less arduous than work in the fields. Workers from the villages are usually between 21 and 40 years of age. The repercussions of this labour shift have been far reaching. Women and older persons who might have otherwise 'retired' have been obliged to continue working in the fields to replace the labour force relocated to ASSBY. Farmers have to look further for male labourers and to pay the newcomers more money to compete with the ship-breaking yard.

By 1999, 25% of survey respondents had abandoned their usual occupation for ASSBY, while the activities of farming, animal husbandry and village labour continued to occupy nearly three quarters of the local population. However, there is a large percentage of people who combine

ASSBY-related occupations with their original occupations.

The appeal of ASSBY-related work, as mentioned above, is readily apparent: more money for less work. This factor attracted a large number of farm labourers to the ASSBY workforce as they are the lowest income earners in the area. The steady expansion of the yard encroached on traditional grazing lands, creating a fodder shortage problem for cattle breeders. New roads and increased vehicular traffic led to many animal casualties. Thus, livestock rearers also drifted towards the ship-breaking yard for employment. Many locals found they could make a living by opening or renting land for khadas (scrap shops) to sell accessories, furniture and equipment removed from the ships. Village artisans, who traditionally served the agricultural community turned to providing services for the ship-yard, and in so doing, acquired new techniques and technology. Others have turned to

small-scale land speculation given the considerable rise in land prices during ASSBY's operation. The character of the yard changes every Sunday, the workers' day off. Many vendors set up their hand lorries and spread cloth on the foot path to sell a host of different items including readymade garments, footwear, toys, mirrors, glass vessels, and other miscellaneous items like pens, combs and belts.

A study of the length of residency of the villagers suggests that ASSBY drew a first wave of migration into the study area from 1982 onwards, so that by 1999, some 18% of residents had arrived after the ship-breaking yard was established. The majority of these people were relatives and friends of the existing residents and integrated easily into the villages. In contrast, during the ten years preceding ASSBY, only 3% of respondents had immigrated into the study villages.

As overall (relative) wealth increased in the study area, it was found that hitherto non-existent money markets began to develop for credit and savings. As more cash began to flow through the local economy, credit became available from new banks, merchants and moneylenders. This was used to improve homes and upgrade the working equipment of artisans and farmers. In the early years of ASSBY, 91% of the villagers were in debt as they availed themselves of the new opportunities for business and took out investment loans. Over the years, however, a quarter of the respondents had accumulated savings in co-operatives and banks.

Responses to questions relating to the effect of ASSBY on specific

aspects of the villagers' lifestyle are further discussed in the following sections.

### Agriculture

A variety of questions were asked of the villagers about the overall impact of the ship-breaking yard on the traditional, essentially agricultural character of the study area. The responses are summarized below:

- Agriculture, which previously had barely exceeded subsistence levels, had become more costly and less profitable since ASSBY commenced operation;
- Higher wages at ASSBY meant that employing farm labour had become more expensive. Indeed, some farmers were supplying their own labour time free of charge (on an exchange basis) for their relatives to offset the lack of affordable labourers;
- Farmers possessing water sources, hitherto used for irrigation and domestic needs, were selling the water on the open market

(including to meet demands from the ship-yard), further reducing overall agricultural production;

- Farmers who have modernized their agricultural practices by using chemical fertilizers, pesticides and hybrid seed, have maintained and improved their productivity and profit;
- Many lower and middle class women with husbands working at ASSBY no longer needed to work in the fields. Children in turn were freed from looking after the home and siblings and were thus able to go to school; and
- Poorer women have been able to find work (albeit manual and heavy) at the ship-breaking yard, and are thus no longer available for the even more arduous labour in the villages or fields.

### Education

Anecdotal accounts offered by older villagers, combined with data gathered by the research team, indicated that over the past 18 years, education has improved and literacy risen

Lunchtime at Manar Village School



significantly. The Gujarat Maritime Board has assisted with improving education and educational facilities, as well as transportation facilities. Additional rooms have been added to existing primary schools and a new secondary school was built at Sathara. Separate facilities have been put in place for the education of girls. Some parents send their children to nearby towns and cities for technical education so that they can work with the mechanical, electrical and electronic equipment being recovered and recycled from the ships.

### Health care

Government dispensaries have been established in some of the 10 villages and a maternity clinic has been set up in Manar. Private medical practitioners have set up practices in some of the villages. The majority of cases, such as the birth of a baby or the treatment of a sick family member, are still dealt with by traditional means first, while modern doctors and clinics are viewed as a last resort. Health care appears to be one of the few domains where traditional attitudes and practices have not changed much since the advent of ASSBY. However, the yard itself has become a source of medicines left over in the ships, which are now dispensed indiscriminately, and at high prices, by unqualified persons.

### Caste

In pre-ASSBY times, caste was very much an integral part of village life in the study area. The system made for a segmented division of society, a rigid hierarchy, caste-based rules for eating and social interaction, civil rights and vocation dictated by caste, and caste endogamy.

Households in the study area still clearly identify themselves by caste. However, the study group cited evidence to show that, since 1982, improved economic status and greater exposure to an urban value system attributable to the ship-breaking yard has caused some blurring of the divisions. There are now mixed residential areas, with members of different castes living in close proximity. For example, the house of a Harijan caste member may share a common wall with that of a Brahmin. There is no more discrimination on public transport in the area. At ASSBY, members of different castes work in the same place and often at the same job.

For an individual, the opportunity to improve their standard of living and to send children to school is afforded by ASSBY and depends on the talent and energy put into work, regardless of caste. ASSBY has created new vocations and business opportunities, inciting many to change their work, leaving traditional caste-related jobs behind. The overall rural character of the study area began to shift, first in employment and then in attitudes and behaviour.

### Marriage

Marriage remains one of the most important events in the life of a young woman and man, as well as the two families concerned (and ultimately the community as a whole). Although marriage is still one feature of village life strongly influenced by tradition, new patterns and attitudes are evolving:

- 63% of marriages are still arranged by the parents, while the future spouses are given some say in the decision in 37% of matches;

- The criteria for selection of a spouse is changing;
- The so-called marriage circle has expanded tremendously, to as much as 500 km in radius; and
- Inter-caste marriage is now more commonplace.

Although officially discouraged by law in India, dowry remains a deeply rooted custom and continues to reflect caste considerations. It places a heavy burden on the family of the bride, while representing a significant source of new assets, in cash or in kind, for the family of the groom. The study team found that with generally improving economic conditions in the ASSBY area, there was a trend towards the seeking and giving of higher dowries. For the family of the bride, status within the community was enhanced by the capacity to provide a higher dowry. For the family of the spouse, particularly if they were entrepreneurial and seeking to create or expand a new business, a dowry provided important resources to invest.

The increasing demands for dowry from prospective in-laws have increased the number of unmarried young women, who in all other respects would be perfectly eligible for marriage. The tendency towards growing dowry demands by prospective in-laws is a negative social development that can be related to ASSBY.

There has been a slight upward trend in what is considered the appropriate age for marriage, to 18 years and over. Again, caste plays a role here with so-called lower castes still holding that marriage at a young age, typically around 15 or 16 years, is socially acceptable, notwithstanding Indian legislation



Women working on the last stretch of road to be sealed on the way to ASSBY

which sets the minimum age of marriage at 18 for girls and 21 for boys.

### Religion

Religion is somewhat peripheral to the discussion of ASSBY's impact on the social and cultural patterns of the villagers in the study area. Suffice to say that religion and Hindu sects remain important features of individual and community life, and are closely linked to caste. In day-to-day terms, villagers working at ASSBY performed daily rituals of prayer (lamp lighting and incense burning along with chanting of mantras) with less frequency than other villagers, citing lack of time and/or fatigue.

With the exception of Bharapara, nearly 90% of villagers in the study area ascribe a quasi religious or spiritual value to the sea, e.g. as a God for Hindus, a saint for Muslims. Responses solicited and anecdotal

evidence suggest that ASSBY has not had a measurable impact on beliefs and practices related to the sea, aside from preventing bathing, believed to cleanse one of all sins, due to increased pollution and associated health and safety risks in the immediate area of the yard.

### Gender

There are several important indicators of change in the attitude towards, and role of, women. In two of the villages, women have been elected as sarpanch (village heads), a status previously restricted to males. A number of women, including two teachers in the area, were of the opinion that the status of women in terms of economic, political and individual freedom is improving under the influence of the yard. Women were moving into a variety of occupations at the yard including drivers, labourers and even as labour contractors; this extended to associated industries and activities.

A typical 'kachha' village house



### Local politics

Existing political structures had not changed. Interviews and discussion suggest that political parties are associated and equated with castes, and political leaders continue to be drawn from the higher castes. However, the study found that there had been a definite increase in the numbers of persons, including women, actively participating in local politics, notably at election times.

### Standards of living and housing

There was a consensus among the villagers of the study area that overall economic well-being had improved, indicated by:

- More local and district transport facilities, both public and privately owned;
- Digging additional wells and putting in new irrigation canals assisted by the Gujarat Maritime Board;
- Increase of land rental received by local landowners; and
- Marked increase in work opportunities and wages.

Traditional dwellings were of the kachha type (clay, cow dung and thatch). The more well-to-do built pakka houses are constructed with tough materials such as cement and brick. ASSBY has generated a thriving trade in discarded ship-board materials and equipment suitable for house improvement, including kitchen, bath and sanitary equipment; paint, windows and doors, curtains and verandas. The installation of an improved electricity supply for the ship-breaking yard had the effect of improving supply to the villages, by reducing cuts and low voltage episodes. Electricity is now available in more than 90% of homes.

#### **Interaction with the migrant workers**

There are very real differences that have created obstacles to the integration of the villagers and the migrant workers; these include language, customs and religious practices. There is a degree of prejudice among the locals with regards to non-Gujarati migrants. A large portion of these migrants come from rurally impoverished Indian states such as Orissa, Bihar, Madhya Pradesh and Uttar Pradesh.

Infrastructure facilities to provide for these workers, usually single men but a small proportion with families, are largely inadequate at ASSBY itself. Single workers live in shacks constructed illegally on Gujarat Maritime Board-owned land adjacent to the yard where as many as ten men share a single dwelling.

All of the villages except Manar refuse to let people from other states settle in their villages. Even at Manar, only those migrant workers

who have come with their families are allowed to stay. In Manar, houses have been constructed for rental to migrants, although at relatively high rates.

The migrant labourers work hard all day, but at night they are alleged by the local villagers to indulge in 'antisocial' practices, such as drinking illegally distilled liquor, drug abuse, hiring the services of prostitutes and homosexuality. Many respondents believe that migrant labourers have fled their home states because of criminal activity and are addicted to alcohol or drugs. Entry into the village by a migrant worker is not allowed and can lead to violent incidents. Single working men are seen as lascivious and a threat to village women. Incidents of petty crime are attributed to the migrants, as are cases of young village girls running away from home, presumably to elope with migrants.

While the migrant labour population in and around ASSBY continues to rise, the infrastructure facilities to absorb them are largely inadequate. Tensions and frictions between the local and migrant populations are increasing and the number of 'antisocial' activities is on the rise.

THE WORK IS PHYSICALLY DEMANDING AND MANY OF THE TASKS ARE VERY RISKY. THE PROCESS OF SHIP-BREAKING IS LABOUR INTENSIVE AND REQUIRES A HIGH LEVEL OF TEAMWORK AND CO-ORDINATION, WHICH IS OFTEN VERY DIFFICULT TO ACHIEVE UNDER PREVAILING WEATHER AND NOISE CONDITIONS.

## Identifying and developing consensus on



## the main issues

The biophysical and socio-cultural surveys revealed that the immediate area has undergone significant changes over the last two decades since the advent of ship-breaking activities. Whilst it was clear that these impacts are most noticeable among the villagers and workers, it was equally clear that those who run and regulate ship-breaking at ASSBY, the ship-breakers and the Gujarat Maritime Board, must be involved in any dialogue in order to mitigate the negative effects of the yard.

A two-day workshop held in Bhavnagar in July 2000 brought together representatives from three of the main stakeholder groups: villagers, ship-breakers and the Gujarat Maritime Board, as well as other persons involved in ASSBY. This meeting marked the beginning of a process whereby individuals and groups began to listen to each others views on various issues, including safety, health care and water supply. Following this very important workshop, the field project was re-focused towards identifying and understanding the views of the four individual stakeholder groups, and then bringing the groups together to resolve some of the outstanding issues.

During 2000–2001, workshops were held with each of the stakeholder groups individually. A villagers' workshop was held on 19 November 2000 at Gram Dakshinamurti Lokshala (a lokshala is a village residential school) in Manar village. A total of 85 representatives, of which almost half were women, from the 10 study villages came to present their problems and related issues regarding the yard. A workers' workshop was held on 17 December 2000 at the AIDS centre hall at the Alang yard, and was attended by over 60 workers. A workshop with the Gujarat Maritime Board officials was held on 14 February 2001 in their office at Alang. A ship-breakers' workshop was not possible, hence meetings were held with individual ship-breakers (eight were interviewed) either at their homes or offices. Preparations for discussions with ship-breakers were handled with the assistance of the Gujarat Ship-Breakers Association. The 'Stakeholders' Convergence Workshop' was held on 16 May 2001 at the Gujarat Maritime Board's office.

## Issues of concern arising from individual stakeholder workshops, 2000–01

### Water resources

Many villagers were very concerned about the serious problem of water supply, which in their view was due to scanty rainfall, rising water demand for agricultural production, and population growth in nearby villages. There is a vast difference in the depth of the ground water table among the 10 villages, ranging from 15 metres below ground to 130 metres. The planting of trees to encourage more rainfall and minimize the loss of surface water was another issue.

Efforts by the Gujarat Maritime Board to solve the water supply problems include the deepening of lakes in Bharapara, Jaspara and Mathavda, the construction of an underground drainage facility at Jaspara, and the excavation of farm ponds (khet talavada).

### Pollution

Villagers were acutely aware that there is a need to ensure the proper disposal of solid and liquid waste, both at and around the ship-breaking yard. In their view the process of ship-breaking contributes to water pollution and the consequent chemical wastes affect the growth of crops. They were also concerned about oil spill-over, from khadas engaged in the oil trade, contaminating the groundwater aquifers.

The ship-breaking process produces a lot of solid waste including asbestos, paint chips, heavy metals, plastic, sludge, glass and ceramics. The disposal of this material is the responsibility of the ship-breakers.



Village woman performing household chores

It is transported to Ahmedabad over 300 km from the yard, which considerably adds to the cost and inefficiency of the entire process.

To begin to solve this problem, the Gujarat Maritime Board has acquired two hectares of land to dispose of the biodegradable and non-biodegradable wastes. A complete solid waste management finance package has been prepared, which includes US\$ 450,000 from the Gujarat Maritime Board. Pending approval of the head office in Gandhinagar, the project should be completed by October 2004.

Noise pollution was another concern, particularly for the villagers of Kathava which is situated on both sides of a main road. Despite speed breakers, heavy daytime traffic disturbs life and school activities. The villagers advocated the need for a bypass road. The frequent traffic accidents, particularly those involving children, were also of great concern.

### Spatial planning and land use

Much of the agricultural land has been sold or rented for use as khadas and some farmers have established their own khadas. This is a part of a larger process occurring all over Gujarat where fast paced industrialization is taking up agricultural land. Gujarat ranks among the most industrialized states of India, and the tilt towards industrialization at the expense of agriculture (and animal husbandry) is likely to have long-term repercussions.

The Gujarat Maritime Board has provided some assistance with infrastructure, including roads and drainage in Alang, roads in Mathavda and Bharapara, and bus shelters within the area. The road in Alang and Sosiya is often congested with heavy vehicles and accidents are quite common. Plans have been prepared to provide parking facilities, and 10 hectares of land have been designated for this purpose.

The Gujarat Maritime Board has designated an area of 17 km<sup>2</sup> as a 'Notified Area'. This includes the villages of Jaspara, Alang, Manar, Mathavda, Bharapara and Sosiya. A Notified Area is an area identified by the Gujarat government Industrial Development Act. This area is supposed to be marked for planned development, providing basic amenities in a regulated and sustainable manner. A Notified Area is also supposed to have proper infrastructure to meet the needs of businesses. In 1998 an agreement was made between the Gujarat Industrial Development Corporation (GIDC) and the Gujarat Maritime Board, according to which the Gujarat Maritime Board will provide all facilities until the area can be self sustaining, at which point it will be handed back to the same Notified Area Authority. Both the GIDC and the Gujarat Maritime Board are bodies belonging to the Government of Gujarat. All of these villages in the Notified Area are on, or immediately adjacent to, the coastline. A master plan has been developed to improve and, where necessary, to provide a variety of primary facilities such as hospitals, schools, gardens and playgrounds. Financial assistance for these projects will be the responsibility of the Gujarat Maritime Board.

### Education

The standard of children's education has vastly improved according to the villagers. Before the formation of the yard, very few children applied for admission to school, as their families did not have sufficient money to pay fees. Today, many families are in a much better position to afford schooling fees for their children. In addition,

improved living standards and increased income have allowed children to be educated to higher standards in institutions beyond their own village. The Gujarat Maritime Board has extended the school buildings in the villages of Mathavda, Bharapara and Sosiya, and undertaken to support school activities.

A village residential school (lokshala) has also planned for vocational guidance and training that will assist those students who intend to start their own business or enter self-employment after completing 10th or 12th standard. Ship-breakers have also shown their interest in this initiative and intend to assist the lokshala with contributions to a Vocational Training Course. Villagers are also interested in vocational training for their children.

Despite these improvements, the workers at the yard feel that the lack of adequate schooling facilities and instruction in their mother tongue for their children is a major impediment to bringing their families to the area.

### Health

Villagers reported that seasonal diseases such as fever and colds were still common, and the residents of Kathava and Sosiya complained of throat burning problems attributed to the contamination of groundwater by oil.

For the workers, the smoke and fumes emitted during the ship-breaking procedures are hazardous to health, and there has been a rise in respiratory disorders. The unhygienic conditions of the yard contribute to the spread of diseases including malaria. Potable water

tanks, when not cleaned regularly, are unhygienic. The surrounding rubbish may also contaminate uncovered water tanks provided for the workers.

Due to improper disposal, solid waste from ASSBY had begun to spill over to the nearby villages and this was of concern to the villagers. Also of concern was increased mosquito infestation due to poor drainage system in villages and market places. Drainage gutters have been completed in a number of villages identified by the Gujarat Maritime Board. Open gutters exist in Alang village.

From the viewpoint of the villagers, the yard has resulted in improved health care with the development of hospitals and clinics, and health facilities provided by different organizations such as the Blood Bank, the AIDS centre, and the Red Cross. A Red Cross hospital, an AIDS centre and a number of unregistered private practitioners are available at the yard. Recently a mobile medical van (Rs. 2 million or US\$ 44,000) was purchased by the ship-breakers who also pay for its running costs. This mobile van is used for first aid treatment and dispensing medicines free of charge. The Gujarat Ship-Breakers Association also supplies a doctor and two fully equipped ambulances.

There remains an overall lack of both health education and awareness among the villagers and the workers. This problem is exacerbated by the number of unqualified doctors practising in the villages and at ASSBY. The workers often turn to the unqualified doctors. Workers do not receive any sick pay, thus they always seek a quick recovery. Taking advantage of their

illiteracy, workers are sometimes given medicines with expired dates, inappropriate medicine and unsterilized syringes. They often suffer dangerous reactions as a result of such malpractice.

The AIDS centre, run by the Bhavnagar Blood Bank, seeks to improve the level of health awareness by distributing information and organizing various health awareness programmes, particularly on AIDS. In addition, there are health awareness camps organized by other institutions. Recently a street play was organized by Mahila College, Bhavnagar, to help raise awareness about health issues. Another encouraging sign is the organization of health diagnosis camps collectively and individually by a number of ship-breakers in their plots.

### Health camp

During the second phase of the project the research team observed that people displayed a lack of interest about their health. The team became increasingly concerned about health issues and took the initiative to organize a health camp for women and children. The school, situated in the centre of the Manar village, was chosen as the place for the camp as suggested by the Sarpanch (head) of the village, the head master and the principal of the school. It was decided to have the check-up health camp on a Sunday which, being a holiday, was the only day when the specialist doctors from Bhavnagar were available. This would also allow the maximum number of villagers and the labourers from the yard to take advantage of the camp. The camp was advertised through pamphlets and notices in the villages, health centre and religious assemblies, and

through cable TV. Separate check-up centres were set up for the women and children in the school classrooms where over 150 women and children were examined.

Based on their check-up of women of all ages, the doctors found evidence of a condition known as fluorosis, which causes pain in the bones and joints. This is caused by excessive fluorine in the drinking water and is most likely due to the falling ground water levels. Inadequate diet was one of the reasons for anaemia among the women. Poor drinking water quality was also responsible for gastrointestinal diseases. The doctors recommended increased consumption of vegetables and milk, filtration and boiling of drinking water, treatment with alum, and increased physical activity to ward off the negative effects of increasingly sedentary lives.

The paediatricians concluded that many of the complaints among the children were due to consumption of gutka (a chewing mixture containing tobacco, betel nut, lime and katha – all addictive and carcinogenic – the katha is extracted from the bark of the *Acacia catechu* tree). Anaemia in children was due to inadequate diet (milk does not contain iron). Ignorance was also one of the causes of poor health. Unhygienic living conditions caused worms in the children. To eliminate these problems the doctors suggested proper diet and strict maintenance of personal hygiene. Other measures are required to restrict the availability and consumption of gutka.

Recommendations stemming from the health camp included the following:

- Frequent medical check-up camps for the labourers working at the ship-breaking yard should be organized and permanent arrangements made for health and medical treatment;
- Health awareness and check-up camps should be organized in every village and their impact recorded, monitored and evaluated;
- Children in school should be informed about the disadvantages of consuming gutka and anti-gutka programmes should be promoted; and
- Different media should be used to increase health awareness, e.g. street plays and exhibitions.

### Living conditions

While most of the villagers felt their living conditions had improved since the arrival of the yard, living conditions were a major concern for the migrant workers, most of whom are young single males. Only 10%, mostly mukadams (labour contractors) and supervisors, live with their families in residences (provided by the ship-breakers) in Alang and Manar.

The workers inhabit shacks lining both sides of the road at the yard. These houses, made of wooden and iron sheets and some plastic materials, are locally known as kholis. They are approximately 10 x 10 m<sup>2</sup> in size and have been constructed by the workers since the beginning of the operations at ASSBY. They encroach on land owned by the Gujarat Maritime Board. About ten workers live in each kholi and they pay a rent of Rs. 40–50 (approximately US\$ 1) per person per month. Basic facilities such as electricity, drainage, potable water and lavatories are

usually absent in kholis. There are public lavatories at the yard, but they are not used as there are too few and are far from the workers' residence.

The Gujarat Maritime Board plans to construct residential houses for the workers, and it has acquired 24 hectares of land for this purpose in Alang and Sosiya. The buildings will be multi-story with primary facilities including water supply, lavatories, electricity and kitchens. In late 2003 dialogue between the Gujarat Maritime Board and the Gujarat Ship Breakers Association was ongoing regarding the financing of the residential scheme. The formation of a committee to finance and oversee the construction is awaited, and will consist of the Gujarat Ship-Breakers Association and the Gujarat Maritime Board contributing one third of the costs, with the remainder to be paid in rent by workers. This committee will work independently under the supervision of the Gujarat Maritime Board and will also consider other housing alternatives.

The availability of potable water is also limited; some ship-breakers provide water for their workers. The Gujarat Maritime Board also has water tanks at certain places, but for some workers they are too far away from the plots and residences. The lack of water prevents adequate washing and cleaning of people, clothes, housing and cooking implements, contributing to very poor sanitation.

The main reasons why workers come to ASSBY without their families relates to the lack of proper residential facilities, lack of schooling facilities for their children at the yard and the general insecurity of income and jobs. Workers interviewed reported that they tried to save as much of their earnings as possible and send it to their families in their home states, while some workers said that they could not save money at all. Many workers return to their original homes for two to three months in the summer to assist their families in farming or other enterprises and then return to the Alang yard.

### Working conditions and safety at ASSBY

Workers labour out in the open in often severe conditions including the rainy season. The work is physically demanding and many of the tasks are very risky. The process of ship-breaking is labour intensive and requires a high level of teamwork and co-ordination, which is often very difficult to achieve under prevailing weather and noise conditions. Safety equipment such as gloves, spectacles, boots and helmets are required for protection during work. These are not always regularly supplied and may need to be purchased by the workers themselves, although this situation varies among plot lessees. In many cases the workers themselves are reluctant to put on the safety gear because they believe that it will hinder their working efficiency.

To prevent frequently occurring accidents, the Gujarat Maritime Board in conjunction with the ship-breakers have historically organized training programmes for workers at the Industrial Training Institute, Bhavnagar. An impressive new training centre with both an auditorium and amphitheatre was completed in 2003. Classes for the workers have commenced and will be conducted by experts, some of them coming from the yard, to instruct the workers about all aspects of the ship-breaking process, including the cutting of heavy iron plates, disposal of gases, and general safety within the ship itself. Additional experts will come from the Engineering and Marine Engineering Colleges in Ahmedabad. The facility will also have a sports ground for the workers to pass their free time and improve fitness.

New training centre completed at ASSBY in 2003





Capt. Y.P. Deulkar (second from left), Port Officer of the Gujarat Maritime Board and members of the research team

The ship-breakers are also concerned about the safety of the workers, and recommended that the plots should be expanded in size to minimize the risk. At present there are four categories of plots: 30 m x 45 m, 50 m x 45 m, 60 m x 45 m and 10 plots of 120 m x 45m designated for non-resident Indians of which only five have been occupied. The ship-breaking process is very difficult in the two smaller sized plots, especially since the cranes need a considerable area within which to operate effectively. The ship-breakers are very keen to see an increase in the size of the plots so that they have more room to operate, can introduce more advanced technological equipment, and can provide better facilities and working conditions. All of the plot leases are due to expire in 2004 and the Gujarat Maritime Board intends to eradicate the less efficient 30 m plots, thereby reducing the number of operational plots to between 80 and 100.

### Labour laws and wages

The most difficult obstacle facing the implementation of labour laws is the lack of understanding among the workers as to their rights and the corresponding responsibilities of the Gujarat Maritime Board and the ship-breakers. The most immediate problem from the workers' perspective was about the laws concerning wages. Proper wage laws were implemented only in selected plots and are not universally observed. A related concern was a lack of understanding regarding their Provident Fund (a kind of pension) accounts. The Provident Fund was created by ship-breakers, and eligibility for membership is acquired after two years permanent work. However, the majority of workers remain ignorant of their Provident Fund number, contributions, available credit, use of pass books, and receipts.

According to general government regulations 12.5% of the employees' basic pay is deposited every month in the Provident Fund (in the bank), plus the interest on the total amount. Ultimately when the employee retires, she/he gets the total amount in their Provident Fund. However, due to the high mobility of the workers, this kind of arrangement has obvious drawbacks.

Each worker at ASSBY has to be issued an identity card by the Gujarat Maritime Board authorizing them to enter and work at the yard. The identity card, also known as the master card, includes a signature, stamps and the number of the plot to which the worker is assigned. There are problems in updating the master cards, given that workers often move between different plots. This also creates problems in keeping track of both wages and contributions by the ship-breakers to the Provident Fund.

Working hours at the yard are from 8.30 am to 6.00 pm including a one-hour lunch break and half an hour tea break, six days per week, with Sunday as a rest day. When the workload is higher than normal, the workers labour for 12 to 14 hours a day, sometimes into the night. There is no overtime rate or payment for holidays. Different wage rates apply for different types of work, often depending on the degree of risk, and rates may vary from plot to plot. Workers often receive no pay slips, and merely sign for their wages. Ship-breakers do not always keep records of wages. The average worker at ASSBY gets approximately Rs. 3,000 per month (US\$ 65 approx.). The workers do not pay tax as they fall below the tax threshold.

An underlying concern for the workers is the provision of permanent employment at the yard. Despite the fact that many workers have been working there for several years, insecurity is rife since a worker can be discharged from their job at any time. As a result, workers frequently move between plots in search of better paid employment. This creates a very transient atmosphere with only rare cases of continuous employment for a long period at the same plot. In addition, ships may not be available for dismantling throughout the year, thus further adding to the irregularity of work availability.

In terms of mobilizing the workforce to present a united voice, there are three major obstacles. These are the lack of a shared language and culture, the workers dependence on a daily wage, and their need to maintain very close relations with their immediate supervisors in order to keep their jobs. In addition, some ship-breakers discourage interaction among

workers of different states at the plots and there is a clear lack of support from any local political group, labour union or NGOs. This may be because most of the workers are non-Gujaratis and do not represent a vote bank.

### Economic considerations

Favourable economic conditions are critical for the viability of the ship-breaking industry at ASSBY. Many ship-breakers and other people who are directly or indirectly associated with the yard acknowledged that the industry was facing severe recession. All of the ship-breakers interviewed believe that since the establishment of ASSBY the economic situation of the Bhavnagar district has greatly improved. The industry also provides employment to thousands of people in Gujarat State and has generated many small and large-scale businesses such as oxygen plants, rolling mills, transportation, construction, catering and scrap-yards, which depend on the yard for their viability.

From the ship-breakers' perspective, the international market and their ability to purchase ships to break, the general state of the Indian economy, the devaluation of the rupee and the present drought condition are among the factors that are currently adversely affecting the ship-breaking industry.

According to many ship-breakers, custom duties and other taxes are very high in India. One pioneer of the ship-breaking industry observed that custom duties and government taxes had increased markedly so that now ship-breakers have to pay a number of taxes (including income, customs, excise and local municipal taxes) to different government departments. They stated that despite these high taxes and duties there was little evidence of sufficient improvements to infrastructure and facilities at the yard such as electricity, roads and water.

### Results of the 2001 stakeholder convergence workshop

After the individual meetings and workshops with the four stakeholder groups, the next stage saw the four groups coming together to exchange ideas and opinions about the issues so as to foster understanding and explore solutions and ways forward. A workshop involving all four stakeholders at ASSBY was held on 16 May 2001 at the Gujarat Maritime Board office. All four groups attended this meeting having prepared in advance their position on the points to be discussed.

One of the most important issues that surfaced during the workshop was the fact that there is a funda-

Typical sign advertising goods for sale at a khada shop



mental difference between the Gujarat Maritime Board and the ship-breakers in their perceptions of, and approaches to, issues at the yard. The Gujarat Maritime Board, as the port authority and administrative body under the State Government, is responsible for the development and management of the ASSBY coastal area. The relationship between the Gujarat Maritime Board and the ship-breakers is a critical one in order to broker and finance agreements concerning the improvement of infrastructure for all four stakeholder parties.

The following represents the main outcomes of the Stakeholder Convergence Workshop. Many of the points raised further emphasize those already discussed in the individual stakeholder workshops:

**Water supply:** For the sustained growth of the ship-breaking yard, the first and foremost problem is that of water supply. All four stakeholder groups were asked to work on providing possible solutions. Improved

water storage in the villages can be provided through rain water harvesting by the construction of farm lakes, canals and check dams. The Gujarat Maritime Board responded that they would start work on a priority basis in the 'Notified Area' (which includes the villages of Jaspara, Alang, Manar, Mathavada, Bhara para and Sosiya), as well as in the villages adopted by them. In other villages such water storage projects would be the responsibility of the villagers themselves. At present the main source of water supply comes from the Mahi Parihage Scheme (from the Mahi River).

**Living conditions for the workers:**

The ship-breakers should provide financial assistance to the Gujarat Maritime Board to construct residential blocks for the labourers, who would be required to pay rent for these units. The first phase of housing 4,800 workers has yet to commence. The steering committee will work independently under the supervision of the Gujarat Maritime Board. All modern ameni-

ties, gardens, dispensary, shops etc. will be provided in the housing complex.

**Worker safety:** Worker safety will be improved through the establishment of a training facility at the yard itself. (Since the workshop, this facility has been established at Alang in 2003.)

**Worker health care:** The need to conduct more work on the health issues facing labourers was acknowledged. The Bhavnagar Blood Bank suggested reducing worker vulnerability to sexually transmitted diseases and HIV by improving working and living conditions, health services, establishing clinics for HIV and sexually transmitted diseases, family welfare centres and adult education classes.

**Noise pollution:** Regarding the noise level near busy roads, the Gujarat Maritime Board has successfully completed construction of a number of roads under the 'Gokul Gram' village development scheme to improve vehicular flow into and out of ASSBY. At the plots, the workers are being provided with ear muffs.

**Provident Fund:** The ship-breakers agreed to provide periodic information about the Provident Fund to the workers.

**Education:** A school is to be started at the yard for the education of the children of the labourers working there.

**Roads:** The Gujarat Maritime Board will work on road widening, and the villagers will cut the 'baval' (*Prosopis juliflora*) trees growing on both sides of the roads, so as to improve visibility and to reduce

Workers with safety gear at the ship-breaking yard



accidents. The Gujarat Maritime Board is prepared to construct a bypass road from Alang if the land can be acquired.

**Recycling:** It was agreed that it was possible to increase the income in the district, if the raw material and scrap generated by the yard was recycled in a planned manner at ASSBY. Other than steel, which comprises 85% of a ship, there are other materials such as panels, cables, compressors, wooden furniture, workshop machinery, engine parts, navigation items, filters etc. This material is transported to other places for dismantling, which adds to the transportation cost. Small organized yards could be set up at ASSBY to dismantle these materials.

The stakeholders agreed that the sustainable development of the yard is of common interest to all and must be founded upon effective dialogue and follow-up action on issues that are identified by stakeholders. The future challenge lies in devising an appropriate mechanism or process whereby this continual dialogue and its appropriate follow-up can be achieved.

### Further stakeholder consultations in 2003

In 2003, a further series of meetings were held over a two-month period and a stakeholder convergence workshop was conducted in October. Many of the issues already identified in the earlier stakeholder consultations of 2001 were again raised as ongoing concerns, some of which were being exacerbated by a lack of communication. It was also noted that mistrust between certain stakeholder groups was intensifying as little progress had been made on



Participants at the workshop in 2003

resolving some of the most pressing concerns. Nevertheless, it was clear that awareness amongst all stakeholders on the need to engage in dialogue was increasing. In particular, discussion was held on the organization of a villagers representative committee to directly liaise with the Gujarat Maritime Board. During the October 2003 workshop, stakeholder representatives and participants also agreed that further efforts need to be made so that all stakeholders can effectively participate and enter into discussion.

Some progress had been made since 2001. Accident prevention, education and training have been improved through activities at the new training facility at ASSBY. In addition, both the Gujarat Maritime Board and the ship-breakers have contributed to improved health services in the yard, and the Gujarat Ship-Breakers Association funds a private primary school for the workers' children in Manar village.

Yet much still remains to be done. The final report (Joshi *et al.*, 2003) identified several key areas for prioritized action and follow-up at the ship-breaking yard and in the surrounding communities. The living conditions of workers are in urgent need of improvement and the land problems of villagers and ship-breakers must be resolved through compensation and improved security of tenure. In addition, it was recommended that the Coastal Regulation Zone Act be implemented in all ten villages within a minimum of a 12 km radius of ASSBY. There is still considerable lack of awareness among villagers and some officials regarding the finer details of this act, as well as the Notified Area, which need to be clarified. Infrastructural improvements are also necessary. Cleaner production systems need to be maintained through improved solid waste management and recycling programmes. Public transportation within ASSBY and the surrounding area should be improved to reduce traffic congestion and accidents. Health, safety and educational issues need further action. Specifically a comprehensive HIV/AIDS awareness programme should be introduced in the ASSBY area to improve the health of the local communities. There is a growing sex worker industry operating in and around ASSBY. This group has emerged as an additional stakeholder group who need to be involved in any follow up work related to health.

Dialogue between stakeholders remains vitally important in order to mitigate conflict and to facilitate agreement on the implementation of effective solutions.

THERE ARE EIGHT DIFFERENT INTERNATIONAL LABOUR ORGANIZATION CONVENTIONS DEEMED BY GOVERNMENTS, TRADE UNIONS AND EMPLOYERS TO BE KEY ENABLING RIGHTS UPON WHICH COUNTRIES CAN BUILD. WITHIN THIS CONTEXT, WORKERS AND EMPLOYERS CAN, AND SHOULD, JOINTLY ESTABLISH A COMMON FRAMEWORK AND SET PRIORITIES FOR IMPROVING THE WORKING ENVIRONMENT.

## Towards a framework for conflict management



## ment at ASSBY

**B**usiness and industry, including formal and informal, private and public undertakings that operate both nationally and internationally play a major role in the social and economic development of a country. These enterprises, producing many goods and services that improve human welfare, are also important in providing employment and livelihood opportunities. The policies and operations of business and industry including research and development can help reduce negative impacts of resource exploitation and promote environmentally sound and sustainable development.

Business enterprises are increasingly recognizing environmental management as a priority and some have attempted to implement environmentally and socially responsible policies through voluntary initiatives. Regulatory policies and the growing consciousness of consumers have also improved environmental and social responsibility in the business and industry sector in many countries.

One priority for the business and industry community is to promote cleaner production systems through technologies and processes that utilize resources more efficiently and at the same time produce less waste for proper disposal. This requires mechanisms to facilitate and encourage innovation, competition and voluntary initiatives, which in turn promote more varied, efficient and effective options. The concept of cleaner production technologies implies striving for optimal efficiency at all stages of the product life cycle. This includes increasing the reuse and recycling of residues and reducing the quantity of waste discharge per unit of economic output.

Responsible entrepreneurship in the business and industry sector is another way to promote sustainable development. Entrepreneurship is an important driving force for innovation, increasing market efficiency and responding to challenges and opportunities. Most importantly, small and medium size entrepreneurs play a key role in the social and economic development of a country. Often, they are the major players in rural development, generating



A stripped ship ready for final cutting

off-farm employment and other remunerative activities. As such, responsible entrepreneurship can greatly improve the efficiency of resource use, reduce risks and hazards, minimize wastes and safeguard the environment.

In order to support sustainable development, governments and employers must respect and promote the rights of individual workers to allow them to freely associate and organize, as enshrined in the mandate of the International Labour Organization Convention. In June 1998 in its 86th session, the International Labour Organization approved the Declaration on Fundamental Principles and Rights at Work and their Follow-up. It refers to freedom of association and the right to organize, freedom from discrimination in employment, freedom from forced labour and the elimination of child labour. There are eight different International Labour Organization

Conventions deemed by governments, trade unions and employers to be key enabling rights upon which countries can build. Within this context, workers and employers can, and should, jointly establish a common framework and set priorities for improving the working environment.

Workers as a group are expected to define, develop and promote policies on all aspects of sustainable development, both independently and in co-operation with international and regional organizations. At the workplace, they can participate in environmental audits, and receive adequate training to augment their environmental awareness, ensure their safety and health, and improve their economic and social welfare, particularly with respect to the rights and status of women in the workplace. In their communities, trade unions can participate in local environment and development activities, including

environmental impact assessments, and promote joint action on potential problems of common concern. Workers' participation in sustainable development is facilitated through education and organization building.

For their part, governments and the private sector need to ensure that workers are able to participate actively in decisions on the design, implementation and evaluation of policies and programmes on environment and development, including employment policies, industrial strategies, labour adjustment programmes and technology transfer.

### Wise practices and their characteristics

Wise practices have been defined as actions, tools, principles or decisions that contribute significantly to the achievement of environmentally sustainable, socially equitable, culturally appropriate, and economically sound development in coastal areas (UNESCO, 2000). The concept of wise practices takes into account the fact that we live in a heterogeneous and changing world and the idea of a best practice is often not achievable or desirable.

A list of characteristics describing wise practices was prepared during a CSI workshop in 1998, and has been subsequently modified and refined. The most recent list (UNESCO, 2002b) is included in the attached table. These characteristics have been used to define CSI activities and in the assessment of field projects and university chair activities. An assessment of the ASSBY project, utilizing these wise practice characteristics, is available in Annex II.

## Wise Practice Characteristics

**Long-term benefit:** The benefits of the activity are still evident 'x' years from now and contribute to the improvement of environmental quality.

**Capacity building:** The activity improves management capabilities, and provides education and knowledge for the stakeholder groups.

**Institutional strengthening:** The activity enhances existing management mechanisms/structures or creates new ones.

**Sustainability:** The activity adheres to the principles of sustainability (the extent to which the results will last and development will continue once the project/programme has ended).

**Transferability:** Aspects of the activity have been applied at other sites in and/or outside the country or region.

**Interdisciplinary and intersectoral:** The activity incorporates all relevant disciplines and sectors of society.

**Participatory process:** Identification of, and transparent consultation with all stakeholder groups, as well as the involvement of individuals, is intrinsic to the activity.

**Consensus building:** The activity builds agreement among a majority of the stakeholder groups.

**Effective and efficient communication process:** A multidirectional communication process involving dialogue, consultation and discussion is utilized.

**Locally responsive:** The activity respects local traditional and cultural frameworks while also challenging their environmental validity.

**Gender and/or other sensitive issues:** The activity accounts for the many aspects of gender and/or other sensitive issues.

**Strengthening local identities:** The activity promotes and strengthens a sense of belonging and self-reliance.

**Contributing to national policy:** The activity assists in informing and shaping government's environmental, legal, economic and social policies.

**Regional dimension:** The activity takes into account the regional, economic, social and environmental perspective among neighbouring countries.

**Human rights:** The activity is sensitive to issues concerning the freedom to exercise fundamental human rights.

**Documentation:** The activity and the lessons learnt are well documented.

**Evaluation:** The activity is regularly assessed to determine the extent to which integrated coastal management has been achieved and/or wise practice characteristics utilized.

During a CSI workshop in 2001 (UNESCO 2002b), which included representatives of the ASSBY project, discussions centred on those characteristics most important to conflict resolution. They were as follows:

- Participatory process
- Consensus building
- Effective and efficient communication process
- Capacity building
- Locally responsive (respect for local traditional and cultural frameworks).

### **Towards a multi-stakeholder agreement at ASSBY**

Management of conflicts over resources and values lies at the centre of most of the CSI field projects, including the one dealing with ASSBY. One of the ideas that has evolved within the framework of wise practices for conflict management concerns multi-stakeholder agreements, which have the potential to bring together all stakeholders, including the various levels of government, in a framework of voluntary compliance. Such potential arrangements have also been tentatively termed 'wise practice agreements'.

Based on previous discussions (UNESCO 2002a), a multi-stakeholder (wise practice) agreement may be characterized by:

- Efficiency: a minimum or absence of disputes, with limited effort needed to ensure compliance;
- Stability: an adaptive capacity to cope with progressive changes, such as the arrival of new users or techniques;
- Resilience: a capacity to accommodate surprise or sudden shocks;

- Equitability: a shared perception of fairness among the members with respect to inputs and outcomes.

One of the main factors leading to increased conflict over resources in many coastal areas has been inadequate legislation and the limited enforcement of existing laws and regulations. Thus the exploration of less formal mechanisms may provide an opportunity to adopt a new approach to deal with conflict prevention and resolution. Multi-stakeholder agreements are not a panacea for all conflict situations and they do not replace the need for legislation and enforcement. There is an entire spectrum from voluntary compliance to external enforcement. A multi-stakeholder agreement might be regarded as a first level attempt at conflict resolution; if unsuccessful it might be necessary to explore and apply different methods.

Several steps have been identified in the formulation and implementation of such multi-stakeholder (wise practice) agreements (UNESCO 2002a). These were further discussed as they relate to the ASSBY project and other field projects at a CSI workshop held in Thailand in November 2002. The steps are identified below:

- 1. Identify the partners in the agreement.** These need not necessarily be confined to local stakeholders but may include national government representatives and international organizations. In the case of ASSBY, four main stakeholder groups have been identified, but there are other interest groups including the former owners of ships sold for breaking, political representatives, media

persons and NGOs. The active participation of these groups is also necessary. International NGOs may be able to assist through lobbying efforts to ensure that Indian labour laws are fully implemented and that the requirements of international conventions to which India is a signatory are fully adhered to, e.g. the Universal Declaration of Human Rights, the Convention on Biological Diversity and the United Nations Convention on the Law of the Sea. At ASSBY, the effective representation of the migrant workers is the single greatest challenge facing the development of a multi-stakeholder agreement (see step 3 below).

- 2. Define the physical boundaries of the area contained by the conflict situation.** At ASSBY, this area has been defined as the ship-breaking yard and the surrounding villages within a 12 km radius.

Not all yards employ cranes such as the one below



### 3. Construct a mechanism for bringing all the stakeholders together.

This should ensure equitable arrangements for discussion and avoid unequal representation by particular parties. Difficulties may also be encountered in determining the representativeness of groups or individuals identified as stakeholders. This is particularly the case at ASSBY where, for example, the migrant workers come from several states with diverse cultures and different languages, and in addition they may not be familiar with procedures for negotiating directly with their employers. Bhavnagar University, acting as a third party with no vested interests, has facilitated meetings with individual stakeholder groups and one joint meeting was held with the four main stakeholder groups to begin to identify and prioritize some of the social and environmental issues. Yet much remains to be done in the field of confidence-building and dialogue to ensure that all stakeholders are adequately represented.

### 4. Reach agreement on the multiple uses of the resource and issues of concern to stakeholders and partners.

At ASSBY, one of the main issues that have been identified are the living and working conditions for the workers at the ship-breaking yard. This in itself is a very complex issue and there may be merit in instigating small-scale multi-stakeholder (wise practice) agreements for such issues. These agreements could then be expanded to include other groups and/or concerns.



General view of the ship-breaking yard

**5. Develop decision-making procedures, rules of enforcement of compliance, and dispute resolution mechanisms.** These have yet to be established at ASSBY.

**6. Establish mechanisms that ensure continuation beyond the project timeframe.** At ASSBY, Bhavnagar University with the support of CSI has initiated the initial consultations and discussions. However, eventually the process will have to be managed and continued by the stakeholder groups themselves. The groups and the issues at ASSBY are extremely complex making this a difficult task. One approach might be for the government to show leadership in managing the continuation of this process. For example the Gujarat State Government, acting in coordination with the national government, has the power to bring the industrial sector (the ship-breakers) to the table.

The project activities at ASSBY offer an excellent opportunity to highlight coastal zone management challenges in Gujarat. Given the enormous development anticipated in the State's coastal areas in the future, the project may provide a demonstration model for conflict resolution through stakeholder convergence.

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## ANNEX I

**Field Project Summary****Environmental, social and cultural implications of a ship-breaking industry, Alang-Sosiya, Gujarat, India**

<b>Revision date</b>	1 June 2003
<b>Title</b>	Environmental, social and cultural implications of a ship-breaking industry, Alang-Sosiya Ship-Breaking Yard (ASSBY) Gujarat, India
<b>Goal</b>	<ol style="list-style-type: none"> <li>1. To develop wise practices for sustainable living and working conditions in the coastal area based on the initial two survey phases</li> <li>2. To build upon existing work on stakeholders' analysis</li> <li>3. To hold workshops for convergence among the stakeholders</li> <li>4. To determine the feasibility and lay the foundation of a 'wise practices' stakeholder agreement</li> </ol>
<b>Location</b>	ASSBY and ten hinterland villages, coast of Gujarat, India
<b>Starting date</b>	January 1999
<b>Partners</b>	<p>Bhavnagar University, Bhavnagar  Centre for Social Studies, Surat (<a href="http://www.centreforsocialstudies.org/">http://www.centreforsocialstudies.org/</a>)  Gujarat Maritime Board, Gujarat  Gujarat Ship-Breakers Association  UNESCO Coastal Regions and Small Islands platform</p>
<b>Co-ordinator of the project</b>	Dr Sumanben Chaudhary, Bhavnagar University, Bhavnagar (third phase)
<b>Hon. Adviser</b>	Prof. Vidyut Joshi, Centre for Social Studies, Surat
<b>Description</b>	In the first phase, environmental and socio-economic surveys were carried out by an interdisciplinary team from Bhavnagar University. Based on the survey data, a stakeholder analysis was carried out in the second phase. Workshops were organized to crystallize and articulate concerns of the villages and the workers

**Stakeholders**

1. Gujarat Maritime Board (GMB)
2. Gujarat Ship-Breakers Association (GSBA)
3. Villagers of hinterland villages to ASSBY
4. Migrant workers

**Achievements and assessment**

1. Increased economic activity due to ASSBY has given rise to a construction boom which has led to encroachment on community grazing lands and increased pressure on fodder and fuel wood plants and 'weed' plants used in traditional medicine.
2. Work at ASSBY is economically more viable for pastoralists and subsistence farmers, who are drifting towards ASSBY for alternate employment. Agricultural laborers have become scarce and more expensive; however, farmers who adopted improved farming techniques are doing well.
3. Overall, economic conditions, education and literacy have improved, but health facilities and awareness have shown only marginal improvement.
4. There is greater social and cultural openness; caste-based rules are becoming less rigid. There is increasing consumerism and traditional values are being replaced by materialism.
5. Women are experiencing greater economic and political freedom.
6. Inadequate provision of water facilities for the ever-increasing population in the study area.
7. There has been some destruction of coastal vegetation, including mangroves, in the wider area around ASSBY.
8. There remain substantial obstacles to addressing the immediate social and environmental problems at ASSBY given the situation that different stakeholders hold different views of ASSBY development.

All the four stakeholders have some common interests which include the development of ASSBY and resolving some of the water problems. The stakeholders also have divergent primary interests as well as conflicting interests. Integration between immigrant workers and local residents is a major challenge.

**Future direction**

1. The scope of the project may need to be expanded in terms of the involvement of stakeholder groups; this will potentially include the Gujarat and Central Governments as well as NGOs.
2. The project will work towards the development of a permanent forum for dialogue between the stakeholders.
3. In consultation with other agencies, and with the direct participation of the four stakeholder groups, the project will attempt to initiate a mechanism that will involve effective representation of all four stakeholder groups in a process of dialogue to address issues and reduce conflicts at ASSBY, on a regular basis. This will be in the nature of a 'wise practices agreement' (a voluntary agreement between the stakeholder groups). This 'wise practices agreement' will have as its goal the prevention and resolution of conflicts, and will also inform policy makers.
4. Foster activities that facilitate convergence between stakeholders interests.

**Sustainable development directions:**

5. Solving water problem through techniques such as water shed management and reverse osmosis.
6. Re-establishing ecological balance by planting mangroves.
7. Implementation of ICZM.

**Current tasks**

1. Preparation of a CSI publication that documents the activities of the project so far, including a synthesis of the first two comprehensive reports produced by the project team at the University of Bhavnagar concerning the environment and stakeholder issues.
2. Documentation of two multi-stakeholder workshops with the four major stakeholder groups to discuss issues of concern, make specific recommendations on how the process of collaboration between the stakeholder groups can be strengthened so as to form the basis for a wise practice agreement and preparation of a list of ten prioritized actions.

## ANNEX II

### Field Project Assessment

#### Environmental, social and cultural implications of a ship-breaking industry, Alang-Sosiya, Gujarat, India

<b>Date of assessment</b>	10–14 December 2001 Assessment completed, 16 April 2002
<b>Assessment conducted by</b>	<p>Mr Derek Elias, UNESCO-CSI, Paris (not closely associated with the project)</p> <p>Mr H. Dube, Head, Department of Life Sciences, University of Bhavnagar (Field project leader)</p> <p>Mr R. Jayakumar, UNESCO Office, New Delhi</p> <p>Mr Vidyut Joshi, Director, Centre for Social Studies, South Gujarat University</p> <p>Mrs Suman Chaudhary, University of Bhavnagar</p> <p>Mr Somnath Bandyopadhyay, Gujarat Ecology Commission (all closely associated with the project)</p> <p>In addition to the work of the team mentioned above, the depth and quality of the assessment was considerably enhanced by the contributions of two postgraduate students at the University of Bhavnagar, Ms Misha Vyas and Ms Rupa Abdi, as well as Mr Jagdish Ganatra.</p>
<b>Project documentation</b>	<ol style="list-style-type: none"> <li>1. UNESCO-CSI Pilot Project on Coastal Management of Alang and Sosia Ship-Breaking Yard. Report on Phase 1 of Project (Environmental Analysis) undertaken between February 1999 and January 2000.</li> <li>2. Report of the 2 day workshop to plan second phase of the Pilot Project on coastal management. 27–28 July 2000, Bhavnagar, Gujarat.</li> <li>3. Sustainable Development of Alang-Sosiya Ship-Breaking Yard. Report on Phase 2 of Project (Stakeholder Issues) undertaken between October 2000 and May 2001.</li> <li>4. Field Project Summary (Revised, 2 November 2001).</li> <li>5. Major postings on the Wise Coastal Practices Forum: (user name = csi, password = wise)             <ul style="list-style-type: none"> <li>■ Industrial safety concerns in the ship breaking industry, Vidyut Joshi</li> </ul> </li> </ol>

**Assessment activities**

- *Changing social conditions and the ship breaking industry,*  
Vidyut Joshi and H.C. Dube

6. Extract from CSI info 10: *Making Unsustainable Development Sustainable: The case of the Alang Ship-Breaking Industry in Gujarat,* H.C. Dube

The project assessment of ASSBY was undertaken on the ground between 10–14 December 2001, at the ship-breaking yard and its immediate environs, as well as at the University of Bhavnagar.

Discussions, meetings and interviews held in Bhavnagar:

- Preliminary discussion of project, arrangements for assessment and 3rd Phase (Water Contract) activities were held with the members of the project team at the University of Bhavnagar.
- Follow-up meeting with Mr Bhavin Shah, Vice-President of the Gujarat Ship-Breakers Association and Mr Nitin Kanakiya of Triveni Ship-Breakers.
- Further discussions with project team members at the University of Bhavnagar.
- Final meeting with ship-breakers, Mr Bhavin Shah and Mr Nitin Kanakiya, and with Mr N. K. Vithani, Secretary of the Gujarat Ship-Breakers Association.
- Interview with Dr Bandyopadhyay of the Gujarat Ecology Commission, including discussion of regional projects and the ASSBY assessment.
- Interviews with Capt. Y. P. Deulkar, Port Officer, and Mr G. R. Jadeja, Civil Engineer, of the Gujarat Maritime Board.
- Preparation of draft assessment and discussion of future activities with partners at the University of Bhavnagar.

Interviews and inspections at ASSBY:

- Inspection of the ship-breaking yard at Alang-Sosiya.
- Interview and inspection of the ship-breaking plot leased by Mr Bhavin Shah, Vice-President of the Gujarat Ship-Breakers Association.
- Interview and inspection of the ship-breaking plot leased by Mr Devang Nagarsheth. This plot is held jointly with his father, Mr Pravin Nagarsheth, President of the Iron Steel Scrap and Ship-Breakers Association of India.
- Discussion of working conditions and issues with a group of migrant workers (about two dozen) at a luncheon stall.

Visits to local environs:

- Visit to Jaspara village and meeting with village head, Mrs Nirmala Ba, and village elders.
- Visit to Manar School and interview with Mr Ranesh, schoolteacher.
- Inspection of 'khadas' (shops selling recycled/recovered items) and interview with a manager.
- Visit to workshop overhauling and re-selling turbines and generators recovered from ship-breaking activities.

**Constraints**

A number of constraints were encountered in carrying out this first project assessment:

1. The unfortunate passing away of Shri Niranjanbhai Vyas, the Chairman

of the Gujarat Maritime Board (GMB) on December 8, 2001. The staff of the GMB, including Port Officer, Capt. Y. P. Deulkar, made every effort to assist the assessment team but were understandably preoccupied with other commitments.

2. Mr Vidyut Joshi, Mr H. C. Dube and Mr Somnath Bandyopadhyay, due to prior commitments, only had limited time to devote to the assessment.

### Field Project Assessment

The sixteen characteristics which define 'wise practices' are used here to assess this field project. A qualitative scale is used as follows:

**None (0):** The field project activities to date do not comply with this characteristic and/or the characteristic is not relevant.

**Slightly (1–3):** The field project activities to date have begun in some preliminary way to satisfy this characteristic.

**Partially (4–6):** The field project activities to date have gone some significant way towards fulfilling this characteristic.

**Fully (7–9):** The field project activities to date have gone the full way to complying with this characteristic.

This assessment is based only on the activities undertaken to date, and does not include those planned for the future.

**Have the project activities ensured long-term benefit?**

**Partially (6)**

Unplanned and unregulated ship-breaking activities commenced in 1983 on the beaches opposite the villages of Alang and Sosiya in the state of Gujarat, India. Threats of sanctions, heavy criticism of environmental and social problems, and increased competition from yards in Bangladesh, China, Pakistan and Taiwan have not prevented ASSBY from continuing to be one of the largest ship-breaking yards in the world. Nevertheless, there has been a reduction in the number of operational plots from over 160 (out of a potential 182) in 1996, to 80 at the end of 2001. It is important to note that, in India, government policy for comparatively new and novel industries such as ship-breaking is developed from practice and experience.

Through dialogue with the four stakeholder groups (the Gujarat Maritime Board, ship-breakers, local villagers and workers), the project has led to a better understanding and some improvement of the problems posed by environmental pollution, poor health and working conditions, and the lack of basic infrastructure and services. Convergence and dialogue are the keys for success in this process. This is acknowledged by all of the stakeholder groups who have displayed a willingness to address problems. Critically there has been awareness-raising, changes in attitudes and action which has had a role to play in improving safety conditions for workers, recycling of hazardous products, solid waste management and the provision of basic health services.

Any long-term benefit is ensured through an institutionalization of the project efforts. However, the dialogue amongst the stakeholders is but the first step towards establishment of a meaningful forum for interaction.

<b>Do the project activities provide for capacity building and institutional strengthening?</b>	<p style="text-align: right;"><b>Partially (6)</b></p> <p>The project activities are contributing to capacity building by changing the attitudes of the stakeholder groups to one another and encouraging understanding and mutual support through discussion. The project activities have contributed and helped to inform some modest improvements in the fields of education, housing, water supply, health services, occupational training, accommodation and waste management. Further stakeholder meetings and workshops are envisaged in order to capitalize on these initiatives and to strengthen both local and regional institutions. Such measures will need to be supported by policy intervention at the central and state government levels that may necessitate a focused attempt towards institutionalization and development of norms through a participatory process.</p>
<b>Are the project activities sustainable?</b>	<p style="text-align: right;"><b>Partially (5)</b></p> <p>The activities have gone a long way in raising awareness and instituting dialogue between the stakeholder groups but will need further development to be established as an independent and on-going process. At present the activities are still, to some extent, dependent upon the partners at the University of Bhavnagar. However, there are some indications from representatives of each of the stakeholder groups that the activities are steadily coming close towards being fully sustainable. Although, it is unlikely the project activities will become fully sustainable until a mechanism to continue dialogue is tested and put into place.</p>
<b>Have the project activities been transferred?</b>	<p style="text-align: right;"><b>Slightly (3)</b></p> <p>The project activities and the industry at ASSBY are unique. There are ongoing discussions concerning the establishment of other ship-breaking yards in the Gulf of Kachchh and, with some adaptation and modification, the activities may be transferred, e.g. Sachana, where a number of ship breakers from ASSBY have already commenced operations. Differences in the industrial, political, economic, social and environmental contexts between ship-breaking yards within the Asian region do not easily lend themselves to simple transfer of project activities. A delegation of ship breakers has travelled to both Bangladesh and Pakistan to view activities at other yards and the project needs to examine how activities at ASSBY may be successfully transferred.</p>
<b>Are the project activities interdisciplinary and intersectoral?</b>	<p style="text-align: right;"><b>Fully (7)</b></p> <p>The project activities involve several different disciplines including the natural sciences: environmental science, hydrology, marine biology and ecology; and the social sciences: sociology and economics. The activities at ASSBY also involve several different sectors of society including government officials and agencies, private industry and business, academic research institutions, the migrant workers and the villagers. There may also be room for the further involvement of local non-governmental organiza-</p>

**Do the project activities incorporate participatory processes?**

**Partially (5)**

tions (NGOs) and women's associations in particular. Further attention could be focused on the social and economic circumstances of the migrant workers.

A participatory process has been initiated; however, its success is limited because the lead role and instigator of the process remains the University of Bhavnagar and the process has not been transferred to another level or group. The ability of workers to participate in the project is constrained by their lack of effective representation, a result of the absence of permanent employment and their floating population. It is this stakeholder group that is the least involved in the participatory process. It is a unique challenge and needs to be addressed in an innovative manner.

**Do the project activities provide for consensus building?**

**Slightly (3)**

The difficulties facing consensus building are considerable, given the divergent economic, cultural, social and legal positions of the four stakeholder groups. These obstacles to consensus building are further compounded by the nature of two of the stakeholder groups. The local villages (10 in all) experience the impacts of ASSBY in different ways depending on factors such as economic base, livelihoods and their geographical proximity to the yards and associated businesses. As a result, they have divergent perspectives concerning the development of ASSBY.

Consideration of intra-group consensus building amongst the migrant workers, primarily from the states of Bihar, Orissa and Uttar-Pradesh, poses a number of problems revolving around the issue of communication. There exist considerable differences between workers on the basis of language, culture, religion, caste and work experience which combine to produce an overall lack of political organization.

The biggest challenge facing consensus building is to devise an appropriate mechanism and platform for communication to regularly bring the stakeholder groups together to discuss issues of mutual concern. Critically, ship-breaking is a business and thus market forces are most effective in regulating the interests and behaviour of the stakeholders, in particular, the ship breakers. More attention should be accorded to how the project activities can capitalize on these forces to realize project goals.

**Do the project activities include an effective and efficient communication process?**

**Slightly (3)**

In terms of communication within and between stakeholder groups, and the provision and distribution of information to these groups as well as the local media, the project activities have been successful. However, further work remains to be undertaken in order to encourage communication between the various stakeholders themselves in addition to the provision of feedback and information to the project partners at the University of Bhavnagar. A critical task to be undertaken is to address the means for effective communication and dialogue, which needs to ensure the increased involvement and participation of workers and policy makers.

**Are the project activities culturally respectful?**

**Fully (7)**

The project activities address the fact that there are considerable cultural variations within the three major groups of migrant workers and within the broader cultural milieu of the State of Gujarat. The activities are sensitive to the considerable variation within the working cultures of the four stakeholder groups at ASSBY. The conflicts and tensions between locals and the different migrant worker groups need further analysis.

**Do the project activities take into account gender and/or sensitivity issues?**

**Partially (4)**

In terms of sensitivity issues, the cultural backgrounds of people living and working at ASSBY are taken into account by the project activities. Successfully incorporating gender issues poses a number of problems given the small percentage of women employed at ASSBY and the difficulty of ensuring their effective representation. The most serious gender issue of concern is the rise in the incidence of the number of women involved in the sex industry and the increased risk in the distribution of HIV and other sexually transmitted diseases (STDs).

**Do the project activities strengthen local identities?**

**Slightly (2)**

In India, identities are based on the interplay between an individual's caste, religion and livelihood. ASSBY is clearly having a major impact on the generation of income for villagers who have found new forms of employment in transport, business and the provision of infrastructure and services. An analysis of potential changes to local identity can only be properly assessed over a considerable period of time and will be substantially affected by the duration of the yard itself and the interactions between local people and migrant workers.

**Do the project activities shape national legal policy?**

**Partially (4)**

There remains a considerable amount of work to be done in terms of addressing legal and industrial policies and laws concerning the ship-breaking industry in India. Currently the industry is regulated by the adaptation and amalgamation of existing legislation, including customs and taxation as well as the Factory Act (1968), the Labour Act (1962) and the Law and Order Act. The National Labour Commission is currently reviewing both the Factory and Labour Acts and has already visited ASSBY. It is widely acknowledged that a broader sectoral response to the activities at ASSBY could involve other intergovernmental agencies and NGOs to inform policy makers. Guidelines have been prepared by GMB, based on the existing laws mentioned above, which could be improved through a process of consultation with stakeholders and experts. Therefore, ASSBY has the potential to influence national legal policy.

**Do the project activities encompass the regional dimension?**

**None (0)**

Due to the nature of the ship-breaking industry at ASSBY and differences between practices and experiences of other yards within both India and

**Do the project activities provide for human rights?**

**Partially (6)**

Asia, there are considerable obstacles to encompassing a regional dimension. The most significant regional dimension is economic and there is a need for this to be addressed more fully.

The project activities have gone a considerable way in drawing attention and responses to the basic rights of access to clean drinking water, adequate shelter, satisfactory labour conditions and issues of health and safety. These are addressed under Articles 22–25 of the Universal Declaration of Human Rights and Articles 6, 7, 8 and 11 of the Covenant on Economic, Social and Cultural Rights.

**Have the project activities been documented?**

**Fully (9)**

The project activities have been fully documented (see list at the beginning of the summary) and have also been the subject of numerous dissertations of post-graduate students at the University of Bhavnagar.

**Have the project activities been evaluated?**

**None (0)**

This present evaluation is the first such exercise.

### **Synthesis of main issues from the assessment**

1. The scope of the project needs to be expanded in terms of the involvement of stakeholder groups; this includes the Gujarat and Central Governments as well as NGOs.
2. The project should develop a permanent forum for dialogue between the stakeholders.

### **Revised future project activities**

1. Disseminate the results of the UNESCO-CSI initiative among other projects, agencies and governments working in the region of ASSBY (including the Indian and Gujarati ministries and authorities; the Government of the Netherlands Ministry of Transport, Public Works and Water; the India Canada Environment Facility; the International Labour Organization; and the World Bank). This will include a workshop/seminar with stakeholders and the University of Bhavnagar, with the following invitees:

Ministry of Ports

Departments of Ocean Development, Government of India

Department of Science and Technology, Government of India

Department of Ports and Fisheries, Government of Gujarat

Gujarat Ecology Commission

Indian Institute of Management

Iron Steel Scrap and Ship Breakers Association of India

Metallurgical and Engineering Consultants (India) Ltd. (MECON)  
National Institute of Oceanography  
National Environmental Engineers Research Institute  
Ferrous Scrap Committee, Government of India

2. In consultation with other agencies, and with the direct participation of the four stakeholder groups, initiate a mechanism that will involve effective representation of all four stakeholder groups in a process of dialogue to address issues and reduce conflicts at ASSBY, on a regular basis. This will be in the nature of a 'wise practices agreement' (a voluntary agreement between the stakeholder groups). This 'wise practices agreement' will have as its goal the prevention and resolution of conflicts, and will also inform policy makers.
3. Preparation of a CSI publication that documents the activities of the project so far, including a synthesis of the first two comprehensive reports produced by the project team at the University of Bhavnagar, concerning the environment and stakeholder issues.
4. The current Water-Phase contract activities (scheduled for completion in June 2002) provide for the following:
  - Two postings to the Wise Coastal Practices Forum regarding the second phase activities and recommendations for implementing action to address water problems at ASSBY.
  - A detailed report on topics related to water management.
  - Initiation of an electronic discussion group concerning the ASSBY project.
  - Involvement and interaction with the Gujarat Coastal Zone Management Authority.

## ANNEX III

### Related articles on the Wise Coastal Practices for Sustainable Human Development forum

The Wise Coastal Practices for Sustainable Human Development (WiCoP forum; user name = csi, password = wise; <http://www.csiwisepractices.org/>) builds on the experiences of the field projects and the university chairs/twinning arrangements to formulate and discuss wise practice concepts in a global perspective. Postings of relevance to the activities of ship-breaking at ASSBY and broader environmental issues in Gujarat are as follows.

1. Cross sectoral approaches to integrated coastal management / Alang and Bhavnagar Bhal-India  
(<http://www.csiwisepractices.org/?read=4>)  
R. Sudarshana, 28 May 1999

Replies:



Perception of disasters  
(<http://www.csiwisepractices.org/?read=9>)  
Gillian Cambers, 6 June 1999



Rumours, perceptions and technology  
(<http://www.csiwisepractices.org/?read=11>)  
R. Sudarshana, 8 June 1999



Forum focus: human activities or human development  
(<http://www.csiwisepractices.org/?read=148>)  
Miguel Fortes, 26 January 2000

2. Coastal zone regulations / India  
(<http://www.csiwisepractices.org/?read=40>)  
R. Sudarshana, 28 May 1999
3. The repercussions of salt extraction / Bhavnagar Bhal-India  
(<http://www.csiwisepractices.org/?read=5>)  
R. Sudarshana, 31 May 1999

Replies:



Questions about salt extraction  
(<http://www.csiwisepractices.org/?read=6>)  
R. Sudarshana, 1 June 1999

 Limiting resource extraction/product standardization (+Bahasa Indonesia)  
(<http://www.csiwisepactices.org/?read=32>)  
Bambang Radi, 5 July 1999

 Salt flats: exploitable resources or rich ecosystems?  
(<http://www.csiwisepactices.org/?read=166>)  
Kavita Khanna, 15 February 2000

 Need versus greed  
(<http://www.csiwisepactices.org/?read=63>)  
Kavita Khanna, 29 July 1999

 Ethics of drinking water  
(<http://www.csiwisepactices.org/?read=7>)  
R. Sudarshana, 1 June 1999

 Supply of drinking water/Indonesia (+Bahasa Indonesia)  
(<http://www.csiwisepactices.org/?read=33>)  
Bambang Radi, 5 July 1999

 Conserving water to offset drought  
(<http://www.csiwisepactices.org/?read=208>)  
Kavita Khanna, 12 April 2000

 Further repercussions of salt water extraction (+Bahasa Indonesia)  
(<http://www.csiwisepactices.org/?read=35>)  
Bambang Radi, 6 July 1999

 The social cost of salt extraction  
(<http://www.csiwisepactices.org/?read=160>)  
Kavita Khanna, 5 February 2000

 Changing the cycle of debt and dependency  
(<http://www.csiwisepactices.org/?read=164>)  
Haraka Gaudi, 12 February 2000

4. Planning for port development / Dholera-India  
(<http://www.csiwisepactices.org/?read=10>)  
R. Sudarshana, 7 June 1999

Replies:

 Tackling one impact of port development: mosquitoes  
(<http://www.csiwisepactices.org/?read=64>)  
Kavita Khanna, 29 July 1999

 Transparency and trust: development projects in Tanzania and India (+Français)(+Español)  
(<http://www.csiwisepactices.org/?read=431>)  
Rupa Abdi, Anne Outwater, 9 July 2002

- 
 Contrasting views on a proposed waterfront development project in Tanzania  
 (+Français)(+Español) (<http://www.csiwisepactices.org/?read=442>)  
 D. Spence, E. Andrés, G. Dearmas, R. Machang'u, N. Mbije, H. Mutafya, N. Pyuzza, K. Robinhawk,  
 25 August 2002
- 
 A proposed waterfront development project in Tanzania – a Caribbean perspective (+Fr)(+Esp)  
 (<http://www.csiwisepactices.org/?read=446>)  
 Lillith Richards, 11 September 2002
- 
 Further views on a proposed waterfront development project in Tanzania  
 (+Français)(+Español) (<http://www.csiwisepactices.org/?read=459>)  
 Daouda Fall, Liliana Gómez, Aziki Slimane, Tanzania Development Research Group,  
 Floris van Ogtrop, 5 December 2002
- 
 Planning for a sustainable future – let's put environment first  
 (+Français)(+Español) (<http://www.csiwisepactices.org/?read=460>)  
 Mark R. Jury, 19 December 2002

5. Local solutions: recharge of wells / Kathiawar-India  
 (<http://www.csiwisepactices.org/?read=41>)  
 Vidyut Joshi and H. C. Dube, 13 July 1999

Replies:

- 
 Local versus private control of water resources  
 (<http://www.csiwisepactices.org/?read=51>)  
 Philippe MacClenahan, 22 July 1999
- 
 Water supply: a case for private control? (+français)  
 (<http://www.csiwisepactices.org/?read=205>)  
 Article from "The Economist", 31 March 2000
- 
 Local and private control of water provision / Tanzania (+français)  
 (<http://www.csiwisepactices.org/?read=211>)  
 Sibylle Riedmiller, 17 April 2000
- 
 Local control of water supply / Papua New Guinea  
 (<http://www.csiwisepactices.org/?read=213>)  
 Mali Voi, 25 April 2000


 People's participation in water conservation / Gujarat-India  
 (<http://www.csiwisepactices.org/?read=294>)  
 Rupa Abdi Desai and Bharati Mehta, 16 November 2000

6. Balancing materialism with morality: Gandhi still lives / Manar-India  
 (<http://www.csiwisepactices.org/?read=77>)  
 Vidyut Joshi and H. C. Dube, 12 August 1999

7. Industrial safety concerns in the ship-breaking industry / Alang-India  
 (<http://www.csiwisepactices.org/?read=85>)  
 Vidyut Joshi, 27 August 1999

Reply:



Balancing global and local industry concerns with environmental and social change / Alang-India  
(<http://www.csiwisepactices.org/?read=280>)  
Somnath Bandyopadhyay, 5 October 2000

8. Changing social conditions and the ship-breaking industry / Alang-India  
(<http://www.csiwisepactices.org/?read=86>)  
Vidyut Joshi and H. C. Dube, 8 September 1999

9. Mitigating land and water salinity problems / Saurashtra and Kutch-India  
(<http://www.csiwisepactices.org/?read=45>)  
R. Sudarshana, 1 October 1999

Reply:



Converting an adversary into an ally  
(<http://www.csiwisepactices.org/?read=223>)  
Rupa Desai Abdi and Bharti Mehta, 15 May 2000

10. Multiple use of a coastal lagoon: success and failure / Chilka Lagoon-India  
(<http://www.csiwisepactices.org/?read=38>)  
R. Sudarshana, 1 October 1999

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