UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

FINAL REPORT

Enhancing Productivity in the Indian Bicycle Sector

FINAL REPORT

Enhancing Productivity in the Indian Bicycle Sector

nal **Designed by** Athenea International/Omnilang.

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

2020

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

ACRONYMS AND ABBREVIATIONS

ABA	Asia Bicycle Alliance
ABIMOTA	National Association of Two Wheels Industries, Hardware, Furniture and Related Products (Associação Nacional das Indústrias de Duas Rodas, Ferragens, Mobiliário e Afins)
AICMA	All India Cycle Manufacturers' Association
ASTM	American Society for Testing and Materials
B2B	Business-to-Business
BIS	Bureau of Indian Standards
CAD	Computer-Aided Design
CAGR	Compound Annual Growth Rate
CAM	Computer-Aided Manufacturing
CBA	Computerized Battery Analyzer
CEVT	National Centre of Supervision and Inspection on Light Electric Vehicles
CFD	Computational Fluid Dynamics
CMM	Composite Metal Matrix
CMT	Controller-Motor-Throttle
CNAS	China National Accreditation Service for Conformity Assessment
CNC	Computer Numerical Control
CONEBI	Confederation of the European Bicycle Industries
CPSC	Consumer Product Safety Commission
CX	Cyclo-Cross
DIC	Director of Industries and Commerce
DIN	German Institute for Standardization
DIPP	Department of Industrial Policy and Promotion
DPIIT	Department for Promotion of Industry and Internal Trade
E-bikes	Electric bicycles
ECF	European Cyclists' Federation
EN	European Standard
EPAC	Electric Pedal-Assisted Cycle
EU	European Union
FEA	Finite Element Analysis
FDM	Fused Deposition Modelling
GC	Governing Council
GM	General Manager
HR	Human Resources
IC-ISID	International Centre for Inclusive and Sustainable Industrial Development
IPR	Intellectual Property Right
ISO	International Organization for Standardization
ITI	Industrial Training Institute
ITPO	Investment and Trade Promotion Office
JIS	Japanese Industrial Standard
JMA	Japan Management Association
JMAC	Japan Management Association Consultants
JVIA	Japan Vehicle Inspection Association
KBTC	Kunshan Product Safety Inspection Institute
LEVA	Light Electric Vehicle Association
METI	Ministry of Economy, Trade and Industry of Japan
MIG	Metal Inert Gas
MSME	Micro, Small and Medium Enterprises

MTB	Mountain Terrain Bike
NABL	National Accreditation Board for Testing and Calibration Laboratories
NiCad	Nickel-Cadmium
NiMH	Nickel-Metal Hydride
NSI	National System of Innovation
OEM	Original Equipment Manufacturer
PBB	Poly Brominated Biphenyl
PBDE	Poly Brominated Diphenyl Ethers
PFC	Patent Facilitating Centre
PLC	Programmable Logic Controller
PMU	Project Management Unit
PSC	Project Steering Committee
Py-GCMS	Pyrolyzer – Gas Chromatograph-Mass Spectrometer
R&D	Research and Development
RDCBSM	Research and Development Centre for Bicycle and Sewing Machine
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RoHS	Restriction of Hazardous Substances
SME	Small and Medium-sized Enterprise
SPM	Special Purpose Machine
SWOT	Strengths, Weaknesses, Opportunities and Threats
TBA	The Bicycle Academy
TCD	Tokyo College of Cycle Design
TERI	The Energy and Resources Institute
TIFAC	Technology Information, Forecasting and Assessment Council
TIG	Tungsten Inert Gas
UCI	Union Cycliste Internationale
UCPMA	United Cycle and Parts Manufacturers Association
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNIDO	United Nations Industrial Development Organization
USD	United States Dollar
WBIA	World Bicycle Industry Association

ACKNOWLEDGEMENTS

The Final Report was drafted in the context of the project - Development and adoption of appropriate technologies for enhancing productivity in the Indian bicycle and bicycle parts sector - funded by the Department for Promotion of Industry and Internal Trade (DPIIT), Government of India.

The report was produced by UNIDO's Department of Trade, Investment and Innovation (TII), under the directorship of Dr. Bernardo Calzadilla-Sarmiento, and the project was managed by Dr. Anders Isaksson and Mr. Farrukh Alimdjanov.

The content of this final report is the work of Ms. Shraddha Srikant, and reviewed by Mr. Vikas Kumar.

Furthermore, we would like to extend thanks to the staff of the Research and Development Centre for Bicycle and Sewing Machine (RDCBSM), the All India Cycle Manufacturers' Association (AICMA) and the United Cycle and Parts Manufacturers Association (UCPMA) for their support and participation in the project.

Proofreading was undertaken by Ms. Lauren Cooke, and final layout and design was undertaken by Mr. Mauricio Mondragon.

EXECUTIVE SUMMARY

The Indian bicycle industry is the second largest in the world, catering for 10% of global production (AICMA, 2019). However, the industry faces several challenges, and there is immense potential to diversify the type of bicycles being produced and increase outreach to international markets. There is a need for the introduction of the latest technologies; development of institutional facilities for product design, selected processes and testing; networking with the international bicycle industry; obtaining global market intelligence; and adoption of global best practices and manufacturing processes.

In such a context, UNIDO implemented a project titled '*Development and Adoption of Appropriate Technologies for Enhancing Productivity in the Indian Bicycle and Bicycle Parts Sector*'[1] (January 2017–November 2019), with the support of the Department for Promotion of Industry and Internal Trade (DPIIT), Government of India. The project aimed to strengthen the capacity and capability of the nodal technical institution, the Research and Development Centre for Bicycle and Sewing Machine[2] (RDCBSM), as well as two industry associations, the All India Cycle Manufacturers' Association[3] (AICMA) and the United Cycle Parts Manufacturers Association[4] (UCPMA), enabling them to provide better technical and management support to manufacturers. The overall goal was to strengthen the global competitive position of the Indian bicycle industry.

The project facilitated comprehensive technical capacity and capability upgrading for the RDCBSM and the associations through a combination of soft interventions (including technology transfer; technical workshops and international study tours; fellowship training programmes; partnerships with international organizations; and hands-on training programmes) and hard interventions (procurement of equipment for the testing facility of the RDCBSM). These interventions provided the beneficiary institutions exposure to, and knowledge of, best available technologies and best practices across the global bicycle industry, and positioned them to transfer knowledge and provide enhanced support to manufacturers.

These programmes were implemented based on an assessment of the baseline scenario, i.e. the existing capacities and skills of the RDCBSM and the industry associations, as well as the needs of the Indian bicycle industry to build a competitive position in the domestic and global markets. This allowed for the prioritization of key areas for technology transfer and training, including standards and testing, bicycle design, newer materials used in bicycles and electric bicycles. Specialised testing equipment was also procured and operationalised at the RDCBSM under the project. The cornerstone of the project was the involvement of, and collaboration with, international industry experts and leading international technical institutions for the various skills-development activities, giving the RDCBSM and associations first-hand access to advanced international expertise and facilities. Applying a training-of-trainers and learning-by-doing approach, personnel from the beneficiary institutions were trained to enable them to further share these learnings with their peers and effectively guide industry in their operations.

The project interventions resulted in:

- Enhanced technical expertise of RDCBSM and the associations and their ability to contribute towards addressing industry-wide challenges
- Strengthening of the RDCBSM's service portfolio and support to the industry, including new testing facilities at the RDCBSM in response to regulatory and export requirements
- Expansion of the RDCBSM's and the associations' institutional linkages with international technical partners and industry actors

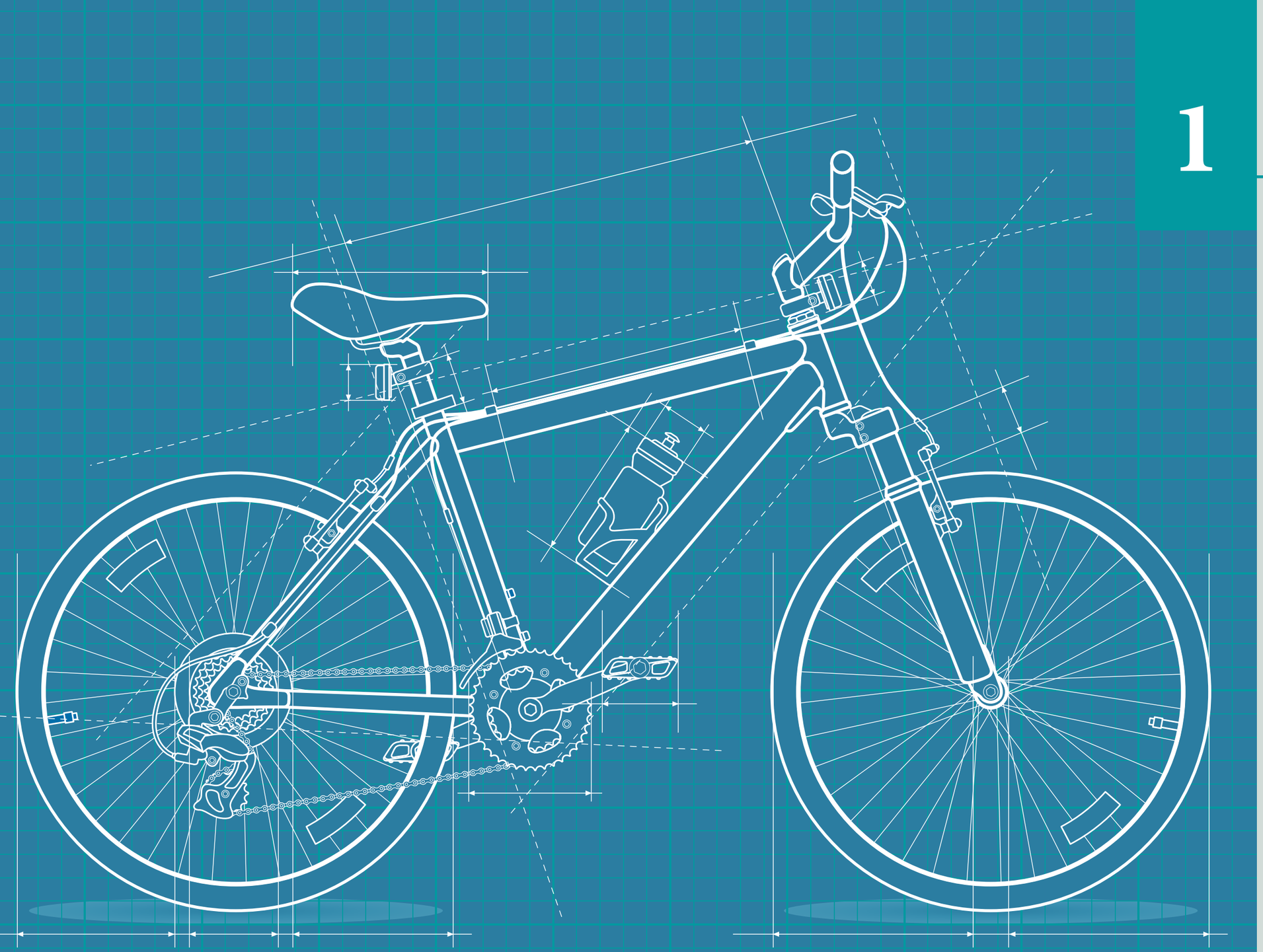
These outcomes are expected to facilitate the adoption of modern manufacturing technologies by Indian bicycle and parts manufacturers, improve productivity performance and competitiveness of units and facilitate the inclusion of small and medium units in global value chains.

This report presents the activities and achievements of the project. The report explains the strategy of the project in addressing the identified challenges and the theoretical foundation of the approach adopted. The execution of each activity, the content of the capacity building programmes, the relevance of the interventions, and the ensuing benefits to the RDCBSM, the AICMA and the UCPMA are also explained. The project's key achievements and lessons learned are then elucidated, along with the findings of the Final Evaluation of the project. The report concludes with inferences and ways forward for the target beneficiary institutions and the industry.

UNIDO's approach has been to strengthen the target beneficiary institutions by developing their critical capacities and enabling them to participate in exchanges with leading national and international technical organizations. This has been done with a view to facilitate comprehensive inputs to policy formulation in line with global best practices and to offer expert handholding to the bicycle manufacturing units by these institutions. The repository of knowledge, enhanced skills and institutional linkages established under the UNIDO project for the RDCBSM, the AICMA and the UCPMA can be utilised towards the provision of continued support to the industry, ultimately building its global competitive position.

[1] Henceforth referred to as the 'UNIDO bicycle project'
[2] ‹http://bsrdindia.org/›
[3] ‹http://aicma.org/›
[4] ‹http://www.ucpma.net/index.html›

1 OVERVIEW OF THE BICYCLE INDUSTRY



Global Bicycle Industry

The global bicycle market is valued at around USD 57 billion and is expected to grow to USD 97 billion by 2029, achieving a compound annual growth rate (CAGR) of 5% (Persistence Market Research, 2019). The growth potential is said to arise from segments such as e-bikes, road, mountain terrain bikes (MTB), and children's bicycles.

According to Persistence Market Research (Global Market Study on Bicycles, 2018), the international bicycle market is driven by certain key trends

- Increased demand for sports bicycles, potentially overtaking hybrid bicycles in terms of growth rate; moderate expected growth for mountain bicycles.
- Increased penetration of e-bikes as compared to conventional bicycles, in terms of both supply and demand.
- Evolving consumer demographics in developing economies, driving the sales of mid-range bicycles, followed by premium-priced bicycles.
- Europe and South East Asia remain important markets (with the highest growth rate values), and potentially sluggish growth in the North American market during 2018–2026.

The major drivers of growth for this market are: the increasing fitness consciousness among people; environmental concerns; traffic congestion; and government programmes to promote cycling. Cycles are increasingly being accepted as an economical, healthy and green mode of transportation, contributing towards efforts to reduce carbon footprints. Increasing government support

encouraging the adoption of bicycles and the rapid development of dedicated cycling infrastructure in developed as well as developing economies will be critical in increasing cycling penetration and boosting the sales of bicycles in the future.

Indian Bicycle Industry

The Indian bicycle industry produces almost 17 million bicycles per annum, providing employment to almost 1 million people. Valued at approximately USD 1.5 billion, the industry is the second largest in the world, catering for 10% of global production (AICMA 2019). The Indian bicycle industry is growing at approximately 1.5% and the production of bicycles is mainly directed towards domestic markets, with exports representing approximately 8% of the total production. The product mix comprises basic roadster category bicycles (60%), children's bicycles (35%) and medium-to-high-end bicycles (about 5%). Therefore, the nature of the domestic demand is mainly from the low-income population, making it a price-sensitive industry (TERI). The exports also mostly comprise the basic roadster bicycle (i.e. low value) segment, directed towards developing countries in Africa and South Asia. Simultaneously, the domestic market is faced with growing competition from the import of good-quality, cheaper parts and bicycles from countries such as China.

The value chain of the Indian bicycle industry operates on two levels—the small and medium-sized enterprises (SMEs) produce bicycle components and accessories, whereas the larger manufacturing units/original equipment manufacturers (OEMs) focus on bicycle assembly and production. According to data from the AICMA, the industry is dominated by 8 major bicycle-producing companies (controlling almost 90% of the market share), medium sized manufacturers (contributing 10% of the market share) and around 3500–4000 SMEs producing bicycle components.

The SMEs, which depend mainly on unskilled and semi-skilled workers, have grown over time but in an unorganised and informal manner and are engaged largely in producing bicycle components and parts. However, the bicycle and parts manufacturing companies, particularly in the small-scale segment, are losing ground and competitiveness in terms of both price and quality. This is primarily due to increased competition from imports, poor manufacturing practices, the continued production of low-end ("traditional") bicycles, and the usage of dated technology. There has been an increasing trend of imported bicycles and parts, with imports growing much faster (25%) than the exports (10%) of Indian bicycles (TERI, 2014).

The state of Punjab holds an 80% share in India's bicycle production. The city of Ludhiana is the hub for bicycle manufacturing in India and the cluster produces almost 40,000–50,000 bicycles per day (TERI, 2014). Government tenders for bicycles constitute a major segment of the domestic demand for bicycles. These tenders aim at procuring basic, low-cost bicycles for the distribution of free/subsidised bicycles to low-income sections of society, especially in rural areas. States like Bihar, Karnataka, Chhattisgarh, Tamil Nadu, Assam, West Bengal, and Kerala have deployed such schemes.

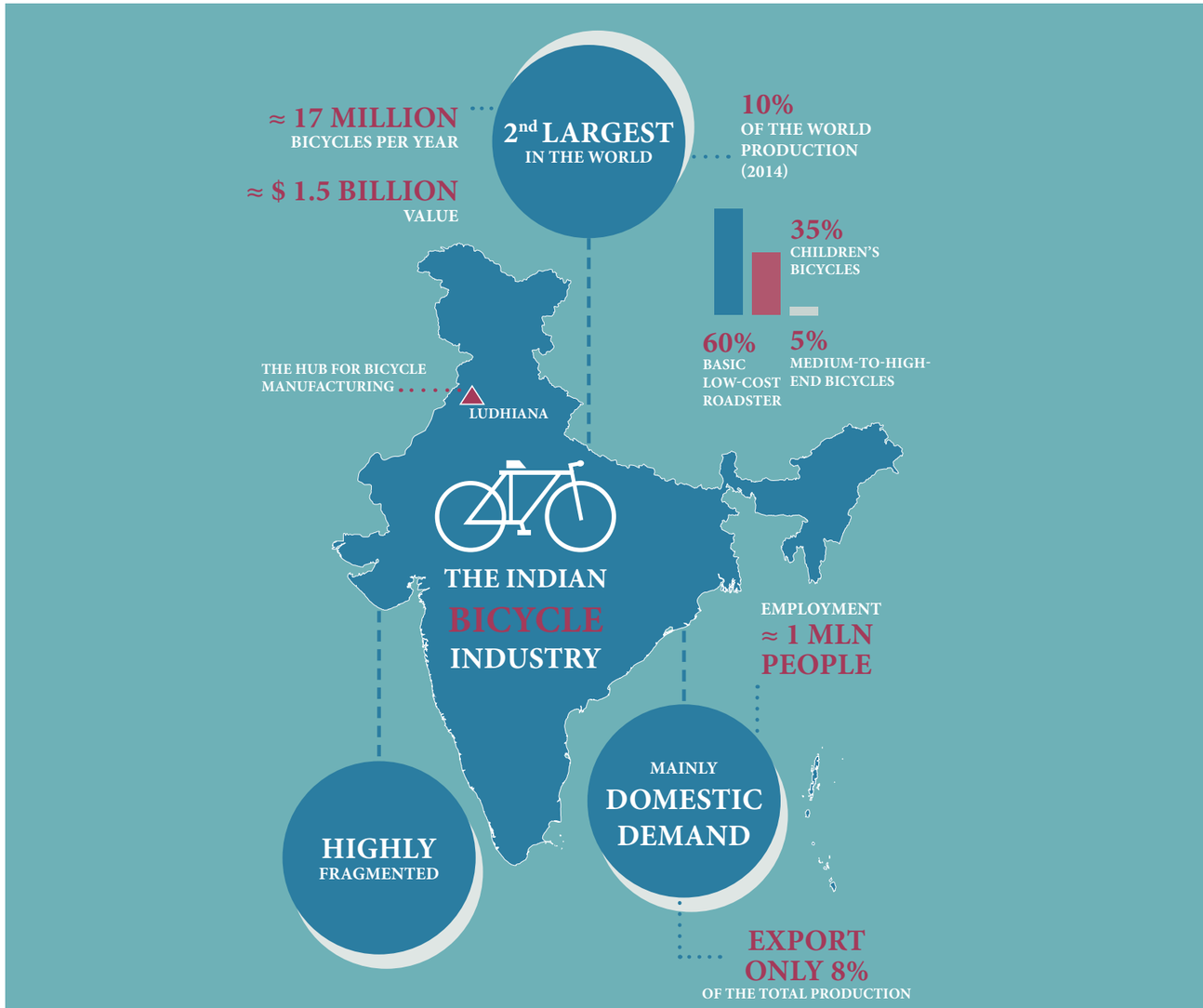
Institutions:

- The industry is supported by the Research and Development Centre for Bicycle and Sewing Machine (RDCBSM)—the nodal technical agency for the industry, located in Ludhiana. Not many countries have a dedicated R&D centre for the bicycle industry, making this a distinctive characteristic for the Indian bicycle industry. The RDCBSM was established as an institutional support centre to provide various facilities to the industrial units, especially the small and medium-scale bicycle and parts manufacturers, to enable them to upgrade themselves and adopt modern production and quality control practices.
- The industry also has two main industry associations—the All India Cycle Manufacturers' Association (AICMA) and the United Cycle and Parts Manufacturers (UCPMA).

There are several key issues that the industry is faced with, including: the limited availability of superior raw materials (such as aluminium, carbon fibre and titanium); the lack of know-how for producing special components (such as derailleurs, shifters and disk brakes) or manual production processes (e.g. in welding); and a lack of R&D infrastructure for advanced technologies.

From a global perspective, the Indian bicycle manufacturing industry lacks:

- Awareness and knowledge of latest technologies and innovations
- Institutional facilities for product design, processes and testing as per international standards
- Communication and networks for interaction with the international bicycle industry
- Global market intelligence for product design
- Awareness of issues such as good manufacturing practices, specialisation, collaborative manufacturing, and branded manufacturing



> Technology development and upgrading is critical to attaining the stated objectives of the policy. Going up the technology ladder is the quickest way to become globally competitive and ensure sustained growth of the manufacturing sector. This will depend not just on the development of indigenous technological expertise, but also on the ability to make crucial technology acquisitions in the global market.
>
> Excerpt from the National Manufacturing Policy 2011 Government of India (pg.12)

© Shutterstock/JPhT

2 UNIDO BICYCLE PROJECT

Project at a Glance

Project title
Development and Adoption of Appropriate Technologies for Enhancing Productivity in the Indian Bicycle and Bicycle Parts Sector (Project ID: 160072)

Donor
Department for Promotion of Industry and Internal Trade (DPIIT)[1], Ministry of Commerce and Industry, Government of India

Budget
USD 1,842,465

Start date
01 January 2017

End date
30 November 2019

Duration
35 months

Country
India

Beneficiaries
Research and Development Centre for Bicycle and Sewing Machine (RDCBSM)

The All India Cycle Manufacturers' Association (AICMA)

The United Cycle and Parts Manufacturers Association (UCPMA)

Thematic areas
Poverty Reduction; Business, Investment, Technology

[1] Formerly known as the Department of Industrial Policy and Promotion (DIPP)

Context

The project was developed in response to a request from the Director of Commerce and Industry, Government of Punjab (dated 07 August 2012) to the Department for Promotion of Industry and Internal Trade (DPIIT), Government of India, for a project intervention by UNIDO (request letter attached as Annex I). The structure of the project was finalised in consultation with the DPIIT and the RDCBSM and was developed in line with the National Manufacturing Policy (2011) of the Government of India. The project document was subsequently signed by the Director General, UNIDO and the Joint Secretary, DPIIT in 2016. Project implementation began in January 2017, upon the release of the first tranche of funds.

Objective

The overall objective of the project was to strengthen the global competitive position of the Indian bicycle industry.

Expected Outcomes

To achieve the project objective, the project aimed to bolster the capacity and capability of the nodal technical institution—the Research and Development Centre for Bicycle and Sewing Machine (RDCBSM)—as well as two industry associations—the All India Cycle Manufacturers' Association (AICMA) and the United Cycle and Parts Manufacturers Association (UCPMA)—to equip these organizations to better assist manufacturers in enhancing their productivity performance and enter export markets. These organizations would thus become a conduit for continued technology transfer to, and handholding of, Indian bicycle and bicycle parts manufacturers.

Theoretical Underpinnings

The search for competitive advantage has led to the recognition of innovation as a vital ingredient for long-term economic development in today's knowledge-based global economy. Innovation is the embodiment, combination, or synthesis of knowledge in original, relevant, valued new products, processes, or services (Luecke & Katz, 2003). Innovation processes are recognised to be a dynamically non-linear, complex, adaptive system and systemic process. It requires the production and transfer of knowledge through different inputs and interactions from and between actors within the system.

All actors are embedded in a wider system of innovation. The national system of innovation (NSI) approach acknowledges that innovative processes are influenced and shaped by the flows of technology and information across government, universities, financial institutions and private sector companies. Studies have shown that certain structures facilitate this creation of new products and processes. Flexibility, agility and responsiveness are crucial in order to understand, adapt and react to the market's needs in a timely fashion (Santos & Hanna, 2009).

When viewed from the perspective of nodal institutions within a system of innovation, "systems centrally involve nodal points of power or influence and network connectivity between nodes" (Cooke, 2008). In this sense, a strong system of innovation is dependent on the ability of key nodal organizations to innovate, which in turn is closely linked to its ability to react to its environment. Following this, 'organizational innovation' is closely linked to the characteristics an innovative organization exhibits ('organizational design'), as well as organizational learning and the organizations' change and adaption in times of changing environments (Lam, 2004). This is particularly true for key nodal technical institutions such as the RDCBSM and the industry associations, which are meant to act as a knowledge resource for the industry, providing applied technical solutions to industry-wide problems.

The RDCBSM is the only national-level technical organization dedicated to the bicycle industry. It therefore has a key role to play in providing critical support services and technology adoption support, especially to SMEs, in keeping with the latest developments in the global bicycle industry. The RDCBSM is positioned to be a pivotal platform for the provision of core support services to the industry (e.g. testing, benchmarking, troubleshooting), introducing and demonstrating new technologies and processes to manufacturers and providing extra guidance to small and medium-sized units. For this, the institution needs to be constantly abreast of the latest developments, maintain constant dialogue with frontrunners in specific technology areas and also develop conducive internal structures and processes for absorption as well as dissemination of newly acquired knowledge. The responsiveness of the majority of the bicycle industry rests on the RDCBSM's ability to provide key and timely technical input and guidance on process/equipment modifications combined with the techno-economic feasibility analyses of sustaining these upgrades. The industry associations play an important role in facilitating this process, by advocating the needs and interests of the industry and supporting the on-ground adoption of new technologies among member companies and vendor networks.

The global bicycle industry is moving towards modern, automated production and assembly practices, lighter, stronger materials, advanced designs and different types of bicycle models. Recognising the role that the RDCBSM and the industry associations would need to play in ensuring the Indian bicycle industry's alignment with global practices in these areas, the capacity building programmes under the project aimed to strengthen their: a) technical proficiency in critical technical areas, b) institutional partnerships with international counterparts and interactions for first-hand information sharing and exposure, and c) service offerings as a result of the enhanced technical expertise gained.

Based on these theoretical underpinnings, the UNIDO approach has been to support the development of critical capacities of these key nodal institutions. The approach highlights that strengthening the institutional innovative capacity would enable these nodal institutions to better support the system of innovation as a whole. This process is based on a comprehensive diagnostic assessment of the organizations followed by a programme of tailored capacity building.

The details of these activities are presented in the following sections.

Project Stakeholders

The project was implemented by UNIDO in close coordination with the DPIIT, the RDCBSM, the AICMA and the UCPMA for the successful completion of the planned interventions. The DPIIT was the supervisory and funding agency from the Government of India (GoI), while the RDCBSM, the AICMA and the UCPMA were the main target beneficiaries of the project activities. Under the supervision of the UNIDO Project Manager, the UNIDO International Centre for Inclusive and Sustainable Industrial Development (IC-ISID, New Delhi) provided institutional support for the implementation of project activities in the field, and also facilitated coordination with the main stakeholders and experts involved in the project. The Centre also housed the project team in India.

Under the framework of the project, a Steering Committee (SC), composed of representatives from the aforementioned organizations provided strategic guidance to the project, ensured coordination of the activities with other initiatives and provided cohesive leadership.

A brief overview of the main stakeholders is presented below:

The Department for Promotion of Industry and Internal Trade (DPIIT)[2]

The Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry, Government of India, is the nodal department for the formulation and implementation of measures for growth of the Indian industrial sector, considering national priorities and socio-economic objectives. The DPIIT also monitors industrial growth and production, as well as select industrial sectors, such as: cement; paper and pulp; leather, tyres and rubber; light electrical industries; consumer goods; consumer durables; light machine tools; light industrial machinery; and light engineering industries. It studies, assesses and forecasts their need for technological development and plans for modernisation and technological upgrading accordingly so the Indian industry keeps pace with the international developments in industrial technology. In the context of the bicycle project, the DPIIT played a supervisory role, monitoring the timely implementation of activities and the achievement of the project's key milestones. Comprehensive status updates of the project's progress were shared with the DPIIT during the Steering Committee Meetings (SCM) held by UNIDO IC-ISID. Furthermore, monthly progress reports were shared with the DPIIT, summarising activity-wise details and indicative timelines for future activities.

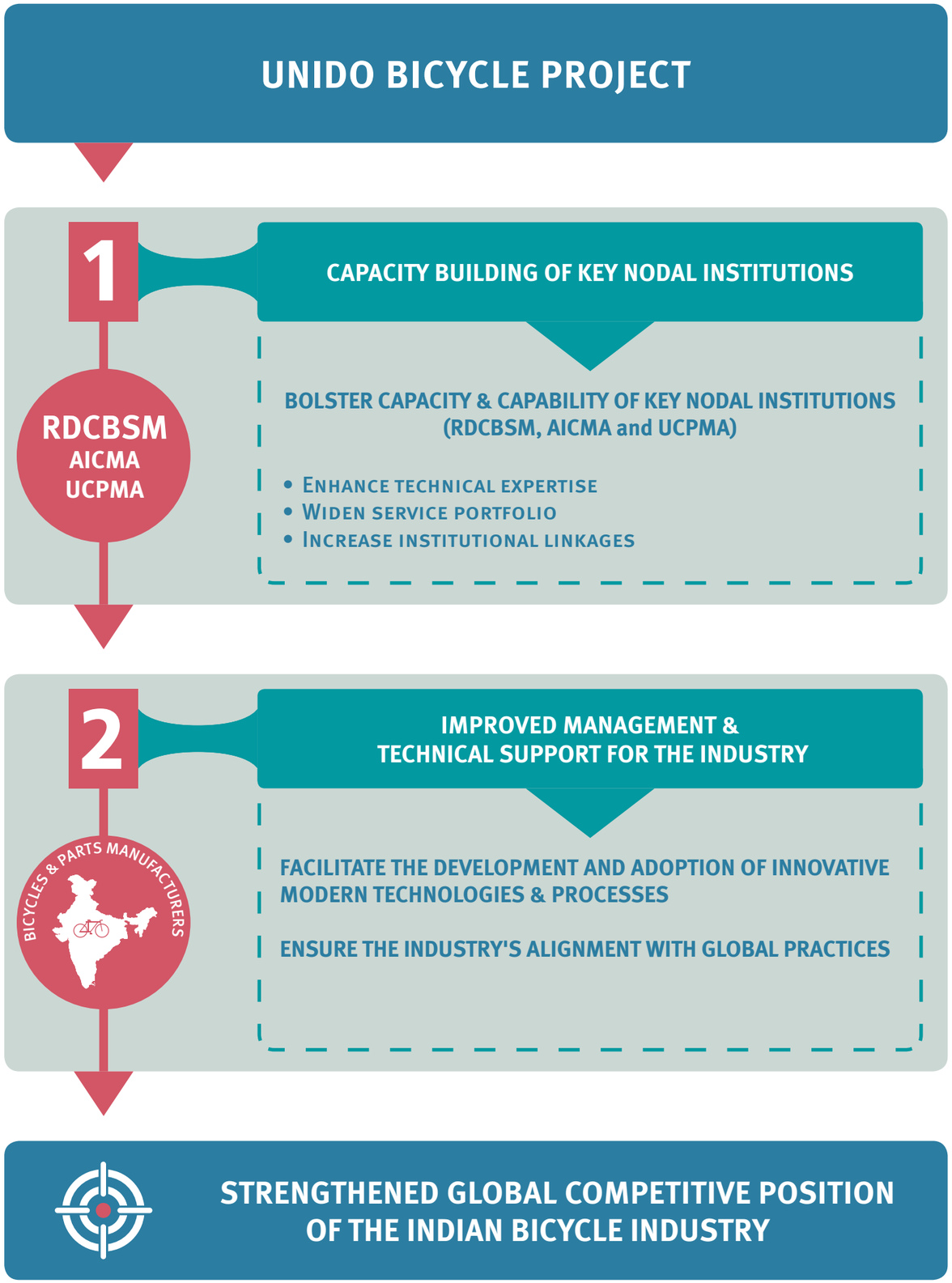
The Research and Development Centre for Bicycle and Sewing Machine (RDCBSM)

The RDCBSM is a national-level R&D centre for the bicycle and sewing machine industries. The RDCBSM was set up in 1983 by the Government of Punjab, with the support of UNDP/UNIDO, with the aim of assisting the industry to adopt innovative technologies for improvements in productivity and product quality. It was fitted with modern equipment for manufacturing, testing, calibration and training activities. The main objectives of the centre are to:

- Create and provide facilities to increase and diversify production
- Acquire, demonstrate, develop and disseminate new technologies
- Develop and transfer technologies as per the skill-level of the industry
- Provide R&D support and common facilities to the industry
- Facilitate skills development in SMEs, especially regarding the adoption of newer technologies
- Provide job-specific hands-on training to the industry

The RDCBSM is meant to provide services such as: marketing and consultancy; product design and development; a precision tool room; testing and calibration; special purpose machine building; mass production machines; and relevant training to the industry. The focus of the centre is on SMEs in the bicycle industry that need a common facility for some of these services and require technical guidance for production.

[2] Formerly known as the Department of Industrial Policy and Promotion (DIPP).



The test laboratories at the RDCBSM are NABL-accredited as per ISO/IEC 17025, and certified by the Bureau of Indian Standards (BIS). In addition, it is also a recognised third-party inspection agency for bicycles. The RDCBSM has disseminated new technologies and methods to the industry, such as cold forging (for bottom bracket axles, pedal axles and cones), tube swaging, and tube butting. The organization has also introduced new special purpose machines (SPMs), testing equipment and cold forging tools to the industry.

The RDCBSM was the main target beneficiary of the bicycle project and all project activities were implemented in close coordination with them. They also provided in-kind inputs to project implementation such as logistics support and the infrastructural/laboratory facilities available at the RDCBSM as sites for project activities. The training activities for the RDCBSM staff were scheduled in keeping with the annual calendar and other service commitments to ensure maximum participation.

The All India Cycle Manufacturers' Association (AICMA)

Established in 1984, The All India Cycle Manufacturers' Association (AICMA) is the apex national body representing the Indian bicycle industry. The members of the association are large-scale bicycle manufacturers, accounting for approximately 90% of bicycle production in India. Some of its members include companies such as Hero Cycles, Atlas Cycles, Avon Cycles and TI Cycles. Its key mandate and role is to secure and promote the future of cycling in India by addressing and catering to the conditions for the competitive growth and development of the Indian bicycle industry. This is achieved through structured advocacy services towards the authorities and through the provision of a number of services to its members.

The main functions of the association are to:

- Establish linkages and engage in advocacy and dialogue for the needs of the bicycle industry
- Promote cycling in India
- Play a catalytic role in the overall growth and development of the Indian bicycle industry
- Act as a think tank for spearheading innovation and transformation of the industry
- Support the establishment of a bicycle-friendly ecosystem in India

The AICMA is a full-time member of the World Bicycle Industry Association (WBIA) and the Asia Bicycle Alliance (ABA). It has dedicated sub-committees that address intellectual property, technical matters, commerce, taxation and demand issues, which member services are channelled through.

The project activities were implemented in close coordination with the AICMA and the identification of technical areas for skill-building was done with their inputs on applicability/relevance in the Indian context. The AICMA also provided valuable support in terms of the Indian bicycle manufacturers' access to manufacturing facilities for various training programmes and consultation meetings.

The United Cycle and Parts Manufacturers Association (UCPMA)

The United Cycle and Parts Manufacturers Association (UCPMA) is among the largest associations world-wide in terms of the number of members (more than 2,250 MSME members). Similar to the AICMA, the primary objective of the association is to bring about the sustained growth of the Indian bicycle industry, with enhanced focus on the needs of component manufacturers. The association works to safeguard the common interests of the industry members, to communicate with the government regarding the main challenges and requirements, and to facilitate the participation of the Indian bicycle industry in international trade fairs for increased exposure. The activities of the association are largely advocacy and policy focused, however, the UCPMA also runs an Industrial Training Institute (ITI), under which basic computer courses are offered to young trainees. Its key mandate and role is to support its members in improving their operation, securing the sourcing of raw materials and help supporting terms and conditions for competitive growth of the industry. The UCPMA works closely with its members and with the legislative authorities of the State of Punjab on the national level.

Project Implementation and Activities

The project focused on building the capacities of the RDCBSM, the AICMA and the UCPMA and the activities and outputs were divided into three phases: (i) Diagnostic Phase, (ii) Capacity building Phase and (iii) Post Implementation Phase. The approach adopted by the project allowed for the analysis of the baseline scenario—i.e. the existing capacities and skills of the RDCBSM, the AICMA and the UCPMA—as well as the needs of the national industry to build a competitive position in the domestic and international markets. This facilitated the identification of the main challenges of the industry, gaps in the RDCBSM's service delivery and expertise and subsequently, an effective orientation of the capacity building programmes to be implemented under the project.

Timeline and budget

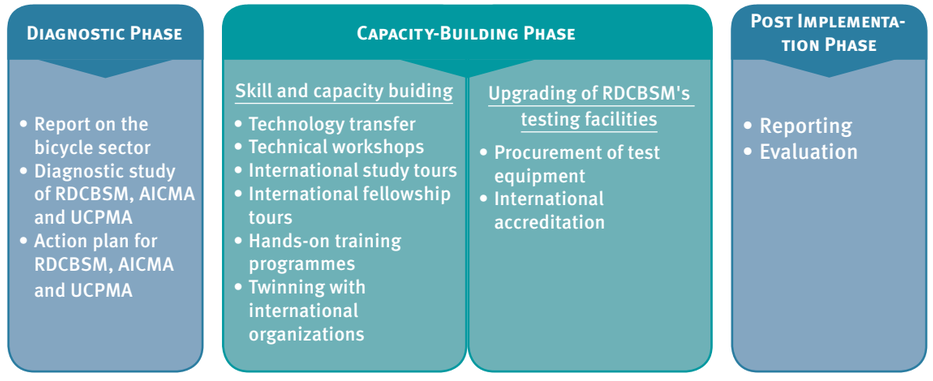
The implementation of the project began on 01 January 2017 and was completed on 30 November 2019. All activities were scheduled as per the availability of international experts and organizations, and in line with the RDCBSM's annual calendar and on-going workload. A timeline of activities is attached in Annex II.

Budget information

Total allotted budget	**USD 1,842,465**
Total expenditure[3]	**USD 18,22,067**

[3] This figure is as of 30 November 2019, including project support costs (PSC); This figure has been taken from SAP and is not certified by UNIDO Finance Department.

Figure 1: Phases of project activities



© Shutterstock/ VGstockstudio

3 DIAGNOSTIC PHASE

Report on the Indian Bicycle Industry

The project began with an assessment of the Indian bicycle industry, conducted by experts from the United States and Japan: Dr. Jeremey James Papadopoulos (Assistant Teaching Professor, Northeastern University, USA), Mr. Kazunobu Tokuda (Senior Consultant, Japan Management Association Consultants) and Mr. Takashi Nagahori (Chairman, O&M Co. Ltd, Japan).

The assessment was based on information collected through:

- An initial assessment of the available background information, analyses, reports, market data and supporting background documentation and data provided by the RDCBSM, the AICMA and the UCPMA
- Semi-structured interviews and interactions with a representative sample of personnel from the RDCBSM, the AICMA and the UCPMA, selected bicycle and parts-manufacturing units and the Government of Punjab

The summary of the report is provided in this section:

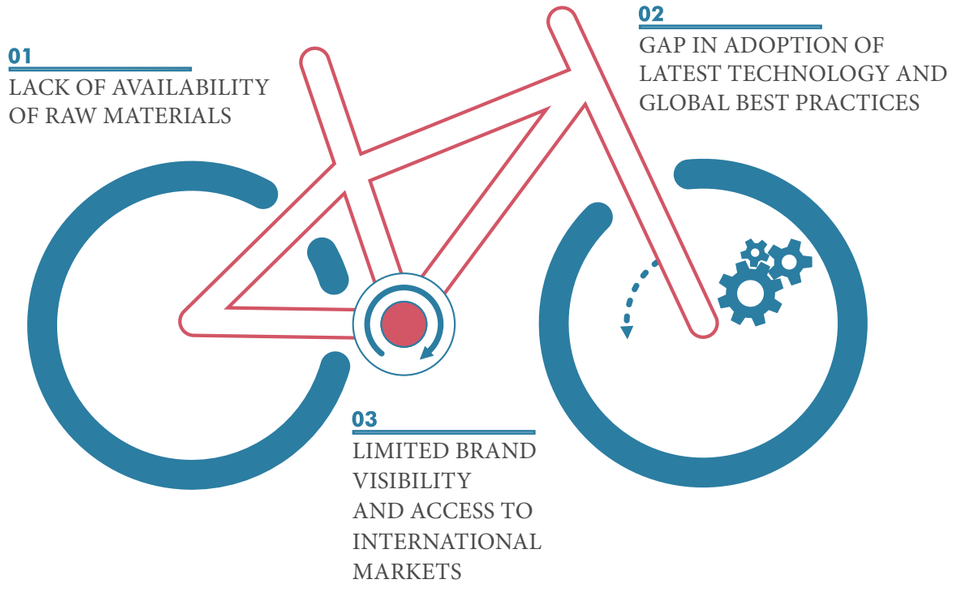
Over the last 20 years, the global bicycle industry has made substantial advances in materials technology (such as composite metal matrix (CMM), alloys, carbon fibre, plastics, titanium, and injection moulding), linked to sophisticated production methods (such as CNC milling coupled with computer aided design-based R&D, as in frame and component designing) and concepts imported from other technologies (such as hydraulic suspension and brake systems, disk brakes, auto and electric gear changing, microchip sensing

systems, specialisation in tyre technology, saddle manufacturing, gear changing devices, folding bicycle design and electric bicycles). These have added further value to higher-end modern bicycles (Oxer, 2000). The pursuit of lightweight and high-strength bicycles in newer, superior materials, with advanced design, drives most upgrades in the bicycle industry. This has introduced a huge range of innovative equipment and processes in producing bicycles and parts that the Indian bicycle industry has not necessarily kept up with.

At present, the Indian bicycle industry largely produces basic models of steel roadster bicycles directed mostly to government tenders, children's bicycles and a very limited volume of premium bicycles. The majority of Indian bicycle manufacturers are currently unable to make and sell the type of bicycles demanded in global markets, which are aesthetically and technically superior, are made from high-end materials, allow multiple-speed settings and require several special components. The product mix comprises basic roadster category bicycles (60%), children's bicycles (35%) and medium-to-high-end bicycles (about 5%). The exports mostly comprise the basic roadster bicycle segment, directed towards developing countries in Africa and South Asia.

The Indian bicycle industry must undergo a considerable improvement/shift in the type of bicycles/components currently being produced (soliciting a range of specific technical upgrading in the manufacturing processes), aided with robust sales and marketing initiatives to establish itself in international markets and gain credibility domestically. If Indian components become attractive to purchasers of these 'better' bicycles, the industry can compete with countries like China and sustain, or even grow, its production. With such attractiveness and competitiveness, they will (i) have a bulwark against imports, and (ii) be able to expand the domestic market with new products.

Key challenges
INDIAN BICYCLE INDUSTRY



The key challenges faced by the industry are:

1. **Lack of available raw materials** in appropriate grades, forms, quantities and prices to make the shift to alternate superior materials viable: The bicycle industry requires the supply of the correct grades/specifications of raw material (with a special focus on aluminium as an immediate requirement) in the form of thin-walled tubes and appropriate production blanks for various components.

2. **Gap in adoption of latest technologies and global best practices:** The level of technology used in the Indian bicycle industry, specifically by the component-manufacturing SMEs, is considered to be basic and conventional. A lot of production processes are largely manual (such as welding and assembly) or operate with dated equipment. For component manufacturers to be able to undertake efficient production of higher-quality components, and in superior materials (such as aluminium alloy), the industry requires access to, and knowledge of, modern manufacturing methods and adaptation/optimisation of equipment to such methods. The main gaps were found to be in:

   - Advanced know-how in modern production techniques and technologies adopted in producing quality components and modern bicycles, such as: TIG/MIG welding, casting, forging, pressure die casting, extrusion, hydroforming, advanced coating methods/surface finishing/plating, injection moulding, painting (automated disc painting, effective manual painting), wheel assembly, bicycle assembly, stickering process (automated/water-based), PLC automation in currently employed processes, raw material composition analysis and selection and energy optimisation, among others.
   - Expertise in producing critical components such as derailleurs, gears, spokes, cassettes, freewheels and disc brakes.
   - Quality management practices.
   - Testing and certification requirements for different export markets: testing for various international standards, raw material testing, environmental/chemical testing, component-specific tests and benchmarking of high-quality components for the development of quality-based tests.
   - Design skills, vis-à-vis aesthetic design for different bicycle models as well as industrial/componentry design.

   Increased competitiveness can come from several shifts in the type and quality of bicycles being made – medium to high-end bicycles that qualify for export markets and are thus demanded domestically as well, and to enhance the currently produced segment through innovative new products (such as electric assist hardware) and skills (e.g. advanced engineering) to optimise the basic bicycle models. For this, manufacturers must have the know-how/capability and infrastructure to produce better-quality bicycles. They also need to ensure that this capacity upgrade occurs within a wider ecosystem that fosters innovation and entrepreneurial initiatives and has increased support and channels for domestic and international sales.

3. **Limited brand visibility and access to international markets** for Indian component manufacturing SMEs: Smaller players in the Indian bicycle industry cater predominantly to the domestic value chain, and do not have established export avenues, with a few exceptions. There is limited branding, quality assurance and ability to cater to very large quantities/specifications. Domestic manufacturers must not only be aware of global best practices adopted for technical, aesthetic and economic viability, but must also be able to establish consumer confidence in the quality of the products, and subsequently develop international sales channels.

While a number of recommendations and market/capacity building initiatives would prove to be valuable for the industry, the essential recommendations for industry survival include:

1. **Material bank for the supply of raw materials – with a focus on aluminium alloy:** A shared material bank and facility to procure the necessary raw materials and provide corresponding processing services for the material provided. Such a bank would comprise:
   - A purchasing agency to commonly source various materials in large quantities, and in turn supply requisite quantities to manufacturers.
   - A warehouse for storage.
   - A common facility for processing of different materials (such as extrusion, permanent mould foundry, heat treatment and hydroforming).
2. **Technical assistance and training** in areas such as: production processes; tooling; component-specific best practices with an added focus on special components; bicycle engineering; exposure to new and emerging technologies; testing services; and design. This would facilitate the adoption of modern manufacturing processes and best available technologies to produce bicycles and components of exportable and consistent quality, aesthetic designs and economical pricing. An exportable bicycle (or component) needs to be attractive, durable, made of aluminium alloy (or other 'light materials'), lightweight and manufactured consistently with attributes of a high-quality bicycle (finish, mechanical operation, durability, functioning, precision).
3. **Focused marketing functions and a common node for sales:** to facilitate increased brand positioning and visibility in international markets, combined fulfilment of large orders, common warehousing in various global locations and uniform product quality benchmarks.
4. **Enhanced advocacy** to the government for key infrastructure/policy-driven issues such as: import duties, freight charges, the promotion of indigenous production, cycling infrastructure and the promotion of cycling.

Figure 2: Recommendations for the Indian bicycle industry

Source: UNIDO, 2019

Diagnostic Assessment of the RDCBSM, the AICMA and the UCPMA

This diagnostic assessment of the RDCBSM and the associations was based on the analysis of available documentation and semi-structured interviews with a representative sample of key actors in the industry, officials of the industry associations, the RDCBSM and the Government of the State of Punjab, India. The assessment was conducted in two phases, covering both institutional and technical aspects:

1. For institutional aspects: by Mr. Jan Haraldsen (Associate Partner, Impello Management, Norway)
2. For technical aspects: by Dr. Jeremy James Papadopoulos (Assistant Teaching Professor, Northeastern University, U.S.A)

The diagnostic assessment was conducted with the aim of correlating the needs and challenges of the Indian bicycle industry with the organizations' responses to, and capabilities in, meeting these requirements. The RDCBSM was evaluated with respect to its framework of operation, governance structure, orientation towards the industry, relationship with central and state governments, R&D programmes and projects, management practices (vis-à-vis management, organisation, skill and infrastructure), recruitment policies and human resource management, marketing, dissemination of information and financing and revenue modalities. The diagnostic assessment was conducted from two stand points: (i) an internal view of the organization with detailed one-on-one staff interviews and analysis of key documents, and (ii) an external view through interactions with key bicycle industry stakeholders. The associations were analysed vis-à-vis their international and technical support network and roles in policy advocacy for the industry.

Table 1: Findings of the diagnostic assessment

RDCBSM	
Service portfolio	
» Testing and calibration are among the key services provided by the RDCBSM to the industry. The mechanical test labs, the standards room and the coordinate measuring machine also cater to the needs of automotive and other engineering industries, as is the case with the chemical/spectro analysis-based testing, where clients from the other industries outnumber bicycle/parts manufacturers. With respect to bicycle testing, the RDCBSM is accredited as per ISO 4210 as well as by Indian standards. However, testing as per specific international standards, execution of tests for bicycles/components in newer materials, environmental and chemical testing and skills for testing of electric bicycles and components need to be facilitated. » The RDCBSM is also involved with the design and development of special purpose machines (SPMs), jigs and fixtures, testing equipment and tooling for the industry. However, there is limited independent prototype development or exploratory design deliberation-based projects.	» The RDCBSM is equipped with high-precision CNC machines and general-purpose tool production machines. While some of the main equipment available is dated and in need of upgrading, there is also a need to expand the scope of the workshop/common facilities towards tools and machines for aluminium alloy and other newer materials. » The RDCBSM offers engineering diploma courses in automobiles, computers and computer engineering, as well as several short-term courses on CAD/CAM, CNC milling and welding. There is a need for greater orientation towards developing more specialised curricula in bicycle engineering and production. » There is a limited provision of consultancy services, troubleshooting support, failure analysis or technology development services and the RDCBSM does not conduct active applied R&D in the field of bicycle production technology or processes.

Skills	Strategy
The RDCBSM faces several technical skill and knowledge gaps and has largely stagnated in skill/technologies development and transfer to the industry. The RDCBSM has not necessarily kept abreast with global market developments and the associated production practices and is therefore not in a position to provide guidance to the industry for relatively newer products and technologies or facilitate the necessary technology sharing.	There is no dynamic long-term strategy document or vision guiding the RDCBSM's activities. As the centre is a self-sustaining organization, the focus is on short-term revenue generation (from other light engineering industries as well), with limited efforts dedicated to furthering services aimed at enhancing its relevance to the Indian bicycle industry.
Industry orientation	**Applied research**
The RDCBSM's interaction with the bicycle industry is fragmented, with a lack of regular structured meetings with industry representatives or framework for regular inputs from industry for collaborative initiatives.	The RDCBSM does not carry out applied research: thus, there are limited collaborative projects for technology development, troubleshooting services, customisation of techniques/ processes, cooperation with academia and awareness of latest techniques.
General management	**Human resource management**
There are several gaps in strategic planning mechanisms, clear delegation of responsibilities, autonomous teams with clear objectives, organizational procedures and reporting channels, distinction between technical and managerial functions, non-digitalised paperwork and communication and standard operating procedures.	With a majority of senior personnel nearing superannuation, a gap in knowledge management is foreseen. The RDCBSM needs to adopt best practices pertaining to recruitment policies and criteria for recruitment for key positions, career progression strategies, clear job descriptions and responsibilities, placement programmes and personnel-exchange with the industry and leading universities.
INDUSTRY ASSOCIATIONS	
The associations play a strong advocacy role for the dissemination of information to members, constant communication with relevant government entities and stakeholders, participation in trade fairs and engagement with schemes/initiatives (such as the 'Cycle Valley' project in Ludhiana and formation of special purpose vehicles for common projects).	The associations would benefit from an increased industry-wide dialogue, strengthened marketing abilities and technical guidance for engaging/ partnering with relevant international companies for technology sharing. They actively advocate for upgrading the entire value chain, covering aspects such as design, material manufacturing and sourcing, tooling, automation-driven and efficient manufacturing, assembly, as well as efficient dispatch and distribution.
The associations are well represented in the Governing Council of the RDCBSM and are therefore well-positioned to facilitate an increased orientation towards industry needs.	The associations are proactive in terms of instituting internal working groups and sub-committees for specific tasks and issues, such that the member companies can collectively find solutions to common issues.

Action Plan

Based on the findings of the diagnostic assessment and analysis of the industry, an action plan for the RDCBSM and the industry associations was proposed. The findings of the diagnostic assessment as well as the action plan were presented to the Director of Industries and Commerce (DIC), Government of Punjab, India at the action plan meeting (09 January 2018).

The recommended action plan comprised two components: Firstly, institutional and management-related aspects for the RDCBSM, and how they could be addressed in collaboration with the industry associations and other key stakeholders of the Indian bicycle industry's innovation ecosystem. Secondly, technical skills support and services that the RDCBSM should be positioned to provide to the industry.

The Indian bicycle industry is uniquely positioned in having a nodal technical agency, the RDCBSM, dedicated to the industry that could also play an instrumental role for R&D as well as for the provision of the relevant support services required by the manufacturers. However, in line with the changing needs of the industry, the service portfolio of the RDCBSM solicits a re-orientation. This would also require strengthening the expertise and technical proficiency of the RDCBSM personnel, in several key areas, to provide the necessary support to manufacturers (see Table 3).

Table 2: Summary of recommendations in the institutional action plan

Observation vis-à-vis the RDCBSM	Recommended Actions
Lack of strategic focus in governance and operations	Increase strategy focus by the Governing Council (GC); conduct SWOT analyses; develop annual strategy documents; regular (e.g. quarterly) meetings with the industry associations; collect customer feedback; institute action-oriented task-force teams
Fragmented contact with the industry and truncated links with other actors such as R&D institutes and government; Lack of robust understanding of industry needs	Hold regular consultation with industry; initiate projects and R&D programmes based on industry priorities; conduct dissemination/ technical workshops for industry; organise personnel exchange programmes; initiate consultancy services; develop contact with vendor networks and technology providers; monitor customer feedback; establish 'key-customer account' programmes; participate in knowledge-exchange with other technical institutions
Limited role in policy deliberations	Facilitate structured expert dialogue on industry-wide issues and challenges; coordinate with/support the associations on policy issues; increase participation in initiatives such as the 'Cycle Valley' of Ludhiana
Absence of R&D	Dialogue with industry to identify key research areas; establish mechanisms for marketable, applied R&D together with manufacturers
Gaps in management practices including human resource management	Define clear job descriptions; devise structured performance appraisal systems; establish a separate marketing/business development unit; streamline reporting channels; management training for staff; recruitment arrangements from leading universities and companies; identification of required expertise areas (e.g. electrical engineering, industrial engineering)
Diversification of revenue streams	Participate in industry-sponsored R&D/technology-development projects; increased triangulation with key stakeholders (academia, industry, government) for access to funding schemes

Table 3: Summary of technical and service-related action plan

Area	Recommendations
Skills development and expertise-building in latest technology areas/global best practices to facilitate the provision of consultancy services	» Engagement of external experts » Areas for training current staff:[4] • Material behaviour analyses (high strength steel, carbon fibre, titanium) • Production efficiency and lean manufacturing • Modern manufacturing processes (such as TIG/MIG welding, surface finishing and plating, assembly, stickering) • Design competence (aesthetic design; industrial design and componentry; supporting tooling/machining - jigs, fixtures, dyes and moulds, as applicable for different materials) • Manufacturing of critical components • Proficiency in testing • Technology development for new products (such as e-bikes, load bearing hybrid roadsters, carbon fibre/ titanium/ bamboo bicycles)
Strengthening of testing services	» Training in the optimal calibration of equipment and measurement of results » Testing as per international standards » Updating of facilities for e-bike testing » Facilities for environmental/chemical tests (RoHS/REACH compliance) » Proficiency in reflector testing » Component-specific testing and material-specific testing » Testing for bicycle accessories, such as helmets and shoes » Non-destructive bicycle testing » Development of bicycle quality tests for benchmarking
Development of design competence	» Training in component geometries and bicycle design-production parameters, joining, component interfaces metallurgy and material behaviour » Training in 3D CAD software » Prototype production » Analysis of existing patent documents for design guidance » Training in application of hydraulics and pneumatics and related engineering principles for design » Design of dies for jigs, fixtures and tools for components of different materials
Alignment of training services with industry needs	» Development of comprehensive worker-training courses in areas such as advanced TIG/MIG welding, advanced coating methods/surface finishing/plating, injection moulding, painting (automated disc painting, effective manual painting), wheel assembly, bicycle assembly, stickering process (automated/ water-based) and bicycle maintenance » Development and delivery of bicycle engineering diploma course » Development of training curricula in consultation with leading technical institutions » Survey to gauge industry training needs » Organisation of component-specific training modules for manufacturers to share and learn specialised best practices
Increased applied R&D function	» Areas could include material behaviour, component interface, stress analysis, optimal configurations for specific components, troubleshooting, advanced engineering and market research
Upgrading of common facilities	» Acquire facilities/equipment for producing aluminium production blanks and supporting services » Establish a pilot facility to be utilised for bicycle assembly experience, demonstration of modern manufacturing processes and reverse engineering exercises

[4] This is not an exhaustive list.

© Shutterstock/wk1003mike

4 CAPACITY-BUILDING PHASE

The core focus of the project was to facilitate the transfer of state-of-the-art technologies to the Indian bicycle industry and a wide range of technical capacity building and training activities for the RDCBSM and the industry associations. The training programmes were conceptualised as a mixture of theoretical explanations, hands-on training and learning-by-doing mechanisms, aided by detailed technical training material.

The main capacity building activities of the project included:

- Technology transfer
- 7 technical workshops
- 4 international study tours
- 3 international fellowship training programmes
- 3 hands-on training programmes
- 7 twinning arrangements
- Procurement of testing equipment for the RDCBSM

Curricula development

To ensure effective orientation of the project, detailed curricula were developed for each of the training programmes conducted. At the time of project conceptualisation, the broad areas identified included: standards pertaining to bicycles and their components (Indian vis-à-vis International- ISO/EN/JIS/DIN); quality-testing; monitoring and systems-selection of suitable new raw materials; new techniques/processes for safety and compliance requirements; health hazard-related issues; patents and intellectual property rights (IPRs); and global best practices/up-to-date technologies in areas such as surface finishing,

metal joining techniques, prototyping, environmental issues and energy efficiency. A synthesis of the diagnostic assessment of the institutions and the industry was used to identify specific technical topics and areas in which personnel from the RDCBSM and the associations needed guidance and handholding. The broad areas shown in Table 4 were identified.

The training programmes were designed and implemented in consultation with highly experienced and specialised international experts as well as leading technical institutes from around the world, who fine-tuned the syllabus for each of the training programmes at the time of delivery. The technical material and curricula were ensured to be in line with latest developments in the global bicycle industry and oriented to the needs of the Indian industry.

The duration of each of these activities was determined to facilitate detailed explanations and interactive discussions and was implemented with appropriate intervals to allow for absorption and internal sharing of information. Each major training activity was followed up by (i) providing the training material used to the RDCBSM for its repository, and (ii) collecting feedback from the participants to effectively orient subsequent activities of the project.

The main interventions and activities of the project are highlighted in the following sections.

Table 4: Areas for technical training programmes

S. No.	Activity	Areas
1	Technology transfer	» Testing of bicycle reflectors » Testing as per RoHS/REACH directives » E-bikes and their components: training and basic equipment for testing of motors, controllers, batteries and data logging for complete bicycles along with necessary software » Transfer of knowledge pertaining to best available technologies/techniques pertaining to new materials (aluminium alloy, carbon fibre) including tubing and joining techniques used in higher-end bicycle models
2	Technical workshops	» Patents and IPRs for the bicycle industry » Standards for the bicycle industry » Bicycle design » Electric bicycles » Material behaviour and failure analysis » Finite element analysis (FEA) for bicycles » Entrepreneurial competencies
3	Fellowship training	» Bicycle testing » Bicycle frame-building and assembly » Electric bicycles
4	Hands-on training	» Bicycle testing » Quality audits » Bicycle assembly

Transfer of State-of-the-art Technologies

One of the main objectives of the project was to facilitate technology transfer to the RDCBSM, the AICMA and the UCPMA. This component of the project was completed through a combination of activities targeting both embodied and disembodied[5] technologies.

Firstly, the project facilitated the procurement, installation and commissioning of the **latest test equipment** along with attendant training for its operation. The equipment procured included the operationalisation of facilities for:[6]

1. Testing of bicycle reflectors

2. Testing as per RoHS/REACH directives

Secondly, the project introduced the RDCBSM personnel to theoretical and practical aspects of **electric bicycles** and their components and sub-systems. Specifically, training was delivered on the testing of motors, controllers, batteries and data logging for complete electric bicycles. As the development and testing of e-bikes and their components are in nascent stages in India, the RDCBSM's expertise in this area was built up combining basic electrical theory, take-down analyses of different components such as batteries and a hands-on training in testing the performance of these components. The RDCBSM was provided with components, tools and test equipment to conduct basic tests on different sub-systems of e-bikes, such as a hub motor, motor controllers, throttles, batteries, controller-motor-throttle (CMT) testers, a Cycle Satiator (programmable battery charger), Cycle Analysts and data loggers, battery analysers, amplifiers, tool kits to set up connections, safety equipment, and software to record results. Using these tools and equipment, participants from the RDCBSM and the industry gained an in-depth understanding of the functioning of e-bike components as well as interpreting performance-test results.

Another focus area for technology transfer was the transfer of **expertise pertaining to best available technologies and techniques for new materials** being used in the bicycle industry (such as aluminium alloy, carbon fibre, high-strength steel), including tubing and joining techniques used for these materials in higher-end bicycle models. This topic was given special emphasis across several capacity building activities of the project. A workshop titled 'Material Behaviour and Failure Analysis' (February 2019) covered the most commonly used bicycle frame and fork materials (steel, aluminium, carbon fibre, titanium) and the construction techniques for each, along with comparisons of relative cost, weight, strength, durability, corrosion resistance and failure modes. Workshops such as 'Bicycle Design' (July 2018) and 'Finite Element Analysis for Bicycles' (March 2019) focused on optimal configurations and incorporating optimisation analyses into product development across materials. The fellowship training on 'Bicycle Frame Building' (October 2018) covered the frame building and alignment process with hands-on experience in welding and brazing techniques. A hands-on training

[5] "There are two types of technology diffusion: "disembodied" diffusion and equipment-embodied diffusion. The former involves the transmission of knowledge, technical expertise, or technology in a way that does not necessarily imply the purchase of machinery and equipment incorporating new technology. This is sometimes an organised process: firms may, for example, sell the rights to a patent or license an innovation. More often, however, it is simply a consequence of innovative activity: the knowledge that the firm develops becomes available to other firms" (George Papaconstantinou et. al, 1996).

[6] Details of the equipment procured is provided under a subsequent section titled 'Procurement of Testing Equipment' (Page 46).

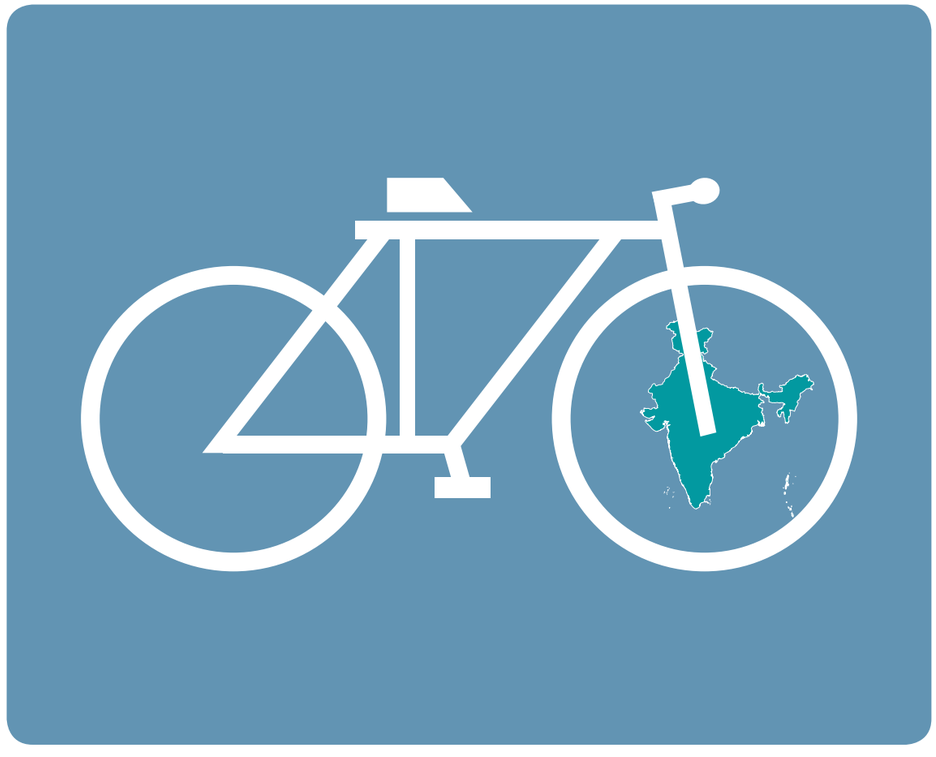
titled 'Bicycle Assembly' was also conducted. The fellowship training 'Bicycle Testing' was a completely hands-on exercise in conducting static and dynamic tests on various components of different materials and defining failure parameters. Details of these individual activities are provided in the following sections.

Technical Workshops

A series of technical workshops were conducted for the RDCBSM, the AICMA and the UCPMA, covering key personnel from all departments and specialisations, as applicable. These workshops were conducted by noted technical experts, with rich industry experience. The workshops were designed to include detailed theoretical explanations as well as interactive/hands-on sessions (for a duration of 2–3 days, depending on the topic being discussed). The topics for the 7 workshops were:

1. Patents and Intellectual Property Rights (IPRs) for the Bicycle Industry
2. Standards for the Bicycle Industry
3. Bicycle Design
4. Electric Bicycles
5. Material Behaviour and Failure Analysis for Bicycles
6. Finite Element Analysis (FEA) for Bicycles
7. Entrepreneurial competencies

The presentations and relevant technical material were provided to the RDCBSM after each workshop.



Workshop on Patents and Intellectual Property Rights (IPRs) for the Bicycle Industry

02-03 June 2017

This workshop was organised in collaboration with the Patent Facilitating Centre (PFC) of the Technology Information, Forecasting and Assessment Council (TIFAC), Department of Science and Technology, Government of India. The expert panel included experts from TIFAC, attorneys specialising in patent applications, a representative of the New Delhi Patent Office and the Patent Information Centre (PIC), Punjab. In total, 24 participants from the RDCBSM, the AICMA and the UCPMA were trained during the workshop.

Focus area

The workshop aimed at training the RDCBSM and the industry associations in the main concepts and applicability of patents and IPRs in the bicycle industry. The technical sessions during the workshop covered an overview of: IPR with case studies; the patenting system in India; copyright issues; novelty and inventiveness in patents; patent analysis with reference to the bicycle industry; managing IP issues in interaction with third parties and collaborative R&D; schemes of IPR support; industrial design and trademarks protection in India; use of patent information for R&D; and hands-on patent searches.

The participants were also provided with a detailed explanation of key procedures and processes for obtaining patents in India: the main IP-related organizations in India; the online patent filing system; application examination procedures; the process and checkpoints of the evaluation of patent applications; different types of patent applications; and routes to file international patents. Examples of the role of industrial design and patenting trends in the bicycle industry were also shared. The workshop included a practical training session on patent searches specific to the bicycle industry, using different patent databases and search methodologies, analysis of patent documents and identification of key data points on patent documents.

The creation of intellectual property through collaborative R&D was highlighted as a main lever for the creation of innovative, marketable technologies, highlighting the potential of technology transfer resulting from research-industry collaboration.

Outcomes

As an outcome of the workshop, the participants became well-versed with patent filing and application systems; identification of patentable ideas and research projects; navigating through various patent databases; industrial applications of intellectual property, and the use of existing patents in the bicycle industry to guide future research. A detailed patent analysis report for the bicycle industry has also been prepared for future reference and usage.

The participants of the workshop were also able to interact with various actors in the Indian IP ecosystem during the workshop – legal attorneys, a patent issuing authority and other experts in different forms of IP, providing a holistic view of the patent process. The RDCBSM also gained an important local resource—the Patent Information Centre, Punjab—for its future IPR-related requirements.

Figure 3: Discussion during the workshop on patents and IPRs for the bicycle industry (June 2017)

Workshop on Standards for the Bicycle Industry

22-23 June 2017

The workshop was conducted by international expert Mr. Marcus Schroeder who is the Managing Director of EFBE Prüftechnik, a leading test laboratory and test machinery provider to the bicycle and e-bike industry world-wide, based in Waltrop, Germany and Taichung, Taiwan. In total, 23 participants from the RDCBSM, the AICMA, the UCPMA and the Bureau of Indian Standards (BIS) attended the workshop.

Focus area

The workshop provided the participants with an overview of modern bicycles and e-bikes, various safety standards applicable to bicycles and e-bikes, global and European product safety laws, risk assessment, common defects pertaining to design, manufacturing and instructions, defect follow-up and recall procedures, examples of proprietary tests and other relevant standards for the industry.

The main technical sessions of the workshop focused on a detailed walk-through of the main components and tests under the international standard for bicycles—ISO 4210 as well as EN 15194 for e-bikes. The participants were given conceptual explanations, elucidation of the steps for testing, common errors and miscalculations as well as observations on some shortcomings of the standards. Various methods for the measurement/evaluation of operational loads were also discussed as a strategy to aid national/international standards for the adaptation to on-ground uses and product behaviour.

The participants were also given exposure to proprietary test programmes, factory/brand standards, magazine tests and other standards such as approval procedures issued by the Union Cycliste Internationale (UCI), the EFBE's 'TRI-TEST', aerodynamic drag tests, frame stiffness tests, fork compliance tests, paint resistance tests and tyre rolling resistance tests.

Outcomes

The participants benefitted from the discussion on the different types of bicycle models prevalent in international markets and their intended use. The main learning for the participants was the different provisions and considerations under the bicycle standards discussed during the workshop. Engineers from the RDCBSM's bicycle test lab were able to identify and correct some mistakes in test execution in their lab. The RDCBSM team also learned the importance of developing a comprehensive test programme to aid testing as per safety standards.

Figure 4: Technical session during the workshop on standards for the bicycle industry (June 2017)

Workshop on Bicycle Design

25-27 July 2018

The workshop was delivered by two international experts from Italy—Dr. Paolo Baldissera and Mr. Salvatore Botrugno, from the Polytechnic College of Turin and Gregario Cycling Development Lab, respectively. In total, 28 participants from the RDCBSM, the AICMA and the UCPMA attended the workshop.

Focus area

The objective of the workshop was to provide the participants with exposure to design specifications and considerations for different models and types of complete bicycles and bicycle components, design techniques for frames/forks made of different materials, optimum frame and fork geometry, 3D computer-aided design (CAD), finite element analysis (FEA) and computational fluid dynamics (CFD).

The technical sessions of the workshop covered different design targets, as well as trade-offs between various parameters (such as aerodynamics vs. comfort and ergonomics, damping vs. efficiency, lightness vs. stiffness) while determining optimal design and component features. The experts also covered design requirements for city/trekking bicycles, folding bicycles, cargo bicycles, velomobiles, racing bicycles (track, CX racing and gravel, triathlon, road racing) and mountain bikes (cross country, mountain/endure, marathon, free ride, downhill, trail). Aspects such as ergonomics, nomenclature and geometric measurements for various components, bicycle stability considerations and steps of the product development process were discussed in detail. The workshop also comprised a hands-on training session on computer-aided design (CAD), focusing on three-dimensional design.

Outcomes

One of the main takeaways for the participants of the workshop was insights pertaining to design and production techniques for bicycle frames and forks made of different materials (steel, aluminium and composite frames). The experts also provided detailed videos to demonstrate production techniques to the participants. In addition, they also shared benchmarks of the strength of different materials vis-à-vis yielding, static failure, buckling, fatigue of materials, and their implications for the design process.

The participants were also able to observe three-dimensional modelling using CAD software and were introduced to new concepts such as computational fluid dynamic and finite element analysis as well as their applications to bicycle design and optimisation.

Figure 5: Demonstration on design software during the workshop on bicycle design (July 2018)

Workshop on Electric Bicycles

14-16 November 2018

The workshop was delivered by international expert Dr. Don J. Gerhardt, from the Light Electric Vehicle Association (LEVA), U.S.A. In total, 27 participants from the RDCBSM, the AICMA and the UCPMA were trained during the workshop.

Focus area

The objective was to introduce the participants to electric bicycles, electric scooters, electric motorcycles, light and special electric vehicles, tools and test equipment for light electric vehicles, electric theory and components, electric bicycle set-up and components, data recording and diagnostics.

The workshop comprised theoretical and practical sessions, to familiarise the participants with different types of e-bikes (e.g. leaning e-trikes, folding, IZIP, dual hub motors, electric hub motor bicycles, electric unicycles) and the various types of components that constitute them, such as batteries (including common sizes, types—lithium, NiCad, NiMH, failure modes), motors (brushed and brushless) and controllers. This was followed by hands-on exercises in wire crimping, butt splicing, the usage of different connectors, soldering and several other techniques to ensure electric wire connections and component connections in an e-bike. The main focus was on testing parameters and procedures for various e-bike components—motors, controllers and throttles, as well as logging data for a running e-bike.

The technical sessions were aided with toolkits and testing equipment that were handed over to the RDCBSM for subsequent training programmes and experimentation.

Outcomes

The participants received training in testing batteries, determining battery capacity, carrying out data-logging and the evaluation/execution of complex connection repairs in e-bike components. They also received 'LEVA e-bike technician certification' for undergoing the four levels of the training. Copies of LEVA's e-bike maintenance manual, a comprehensive technical resource comprising theory, market information and usage guidelines for various components and complete e-bikes, were also given to the participants. Additionally, they learned about tools such as the Cycle Analyst, a computerised battery analyser and a controller-motor-throttle (CMT) tester. Various practical factors for consideration while testing were also discussed, such as the effect of payload on performance, controller failure, battery durability/failure under various loads, environment tests (humidity, moisture), vibration tests, battery dip tests and throttle durability tests.

In addition, the expert provided the participants with information on the latest products and technologies available in the global markets, with an overview of products, brands and innovations presented and discussed in leading bicycle trade shows such as Eurobike 2018 and Interbike 2018. The expert also introduced leading diagnostics systems such as the 'Bosch E-bikes Diagnostic System', which provides the industry benchmark in product quality standards.

Figure 6: Hands-on training for battery testing during the workshop on e-bikes (November 2018)

Workshop on Material Behaviour and Failure Analysis for Bicycles

11-13 February 2019

The workshop was conducted by international expert Mr. Lucas Elrath, from Robson Forensic (U.S.A), an organization involved in technical investigations, crash reconstruction, analysis, reports, and the resolution of commercial and personal injury litigation involving bicycles. In total, 27 participants from the RDCBSM, the AICMA and the UCPMA were trained during this workshop.

Focus area

The main focus of the workshop was on the most commonly used bicycle frame and fork materials (steel, aluminium, carbon fibre, titanium) and the construction techniques for each, along with comparisons of relative cost, weight, strength, durability, corrosion resistance and failure modes. The manufacturing methods available for each frame/fork material and bicycle components were also covered, including the equipment required, skill level, and related processes necessary for each technique. In addition, testing as per international standards, typical test results and reasons for failure were explained. The expert also explained the analysis process of real-time failures in bicycles and components, covering the diagnostic process, concentrated-stress points, reasons for premature failure and life cycle considerations. The expert conducted an interactive failure-analysis exercise for several failed components from the RDCBSM's test lab to demonstrate how to thoroughly investigate failures.

Outcomes

The participants received an in-depth explanation of the handling considerations and use of carbon fibre, including how to join frame segments, how it behaves when it fails, how to control frame geometry while joining carbon fibre, profiling techniques and how to determine the number of carbon fibre layers to be used. The expert also covered 'hydroforming', a high-interest area for the Indian bicycle industry, vis-à-vis the uptake of aluminium for frame/fork production.

For the RDCBSM, an important outcome of the workshop was the information about the safety standards issued by the Consumer Product Safety Commission (CPSC), U.S.A. This reference legislature acts as an important guide to understanding the extent of manufacturer liability in case of product failures. In addition, the RDCBSM also learned about tests that could be carried out to diagnose specific component failures, the most common and critical tests as per different international as well as American (ASTM) standards, and how test results are to be interpreted in such cases of failures.

The RDCBSM also developed the know-how to determine causes of failure in components (i.e. whether the issue is in the use, material or manufacturing) based on the practical failure analysis exercise. This would help them in providing additional support to manufacturers whose products do not pass specific standards.

Figure 7: Technical sessions of the workshop on material behaviour and failure analysis (February 2019)

Workshop on Finite Element Analysis (FEA) for Bicycles

14-16 March 2019

The workshop was delivered by two international experts from Italy—Dr. Paolo Baldissera and Mr. Salvatore Botrugno, from the Polytechnic College of Turin and Gregario Cycling Development Lab, respectively. In total, 24 participants from the RDCBSM, the AICMA and the UCPMA attended the workshop.

Focus area

The workshop covered the basic concepts of finite element analysis methods such as the pre-processing stage, solver stage, post-processing stage, geometry import and cleaning, nodes, one, two and three-dimensional elements, materials and their properties, constraints, loads and load-steps, different types of analysis and output results. The workshop mainly comprised hands-on modelling sessions with one, two and three-dimensional elements, for bicycle components such as frames, forks and cranks in aluminium as well as carbon fibre. The workshop also covered aspects of topology optimisation during finite element analysis and methods to simulate fatigue and load testing of components. In addition, the experts provided the participants with exposure to newer software and newer finite element analysis methods being used in the bicycle industry.

Outcomes

The step-by-step tutorial model of the workshop helped the participants, especially the design and development team at the RDCBSM, to learn how to operate the Altair Hyperworks software, which the training was conducted on. This would not only be useful for in-house design projects, but also for delivering further training programmes to industry. The workshop content also covered how modelling and optimisation processes differ for different materials (i.e. aluminium vs carbon fibre).

The simulation of static and fatigue tests allows for the modelling of component behaviour in real-time testing conditions. With this expertise, the RDCBSM could support manufacturers in their product development process, as a step preceding prototype development. This would save fabrication costs for multiple non-optimal prototypes.

Figure 8: Hands-on training during the workshop on finite element analysis for bicycles (March 2019)

Workshop on Entrepreneurial Competencies for the Bicycle Industry

29–30 July 2019

In order to facilitate the growth and export competitiveness of the industry it was considered important that Indian manufacturers of bicycles and components, especially the small and medium-sized enterprises, not only build their technical competency, but also enhance their business development and entrepreneurship skills. This would, in turn, upgrade their business as per international standards, strengthen their business set-up to become dependable partners for large companies and develop and expand sustainable business linkages. The workshop was delivered in cooperation with the United Nations Conference on Trade and Development (UNCTAD). The workshop was based on UNCTAD's flagship technical assistance programme 'Empretec' and was delivered by the National Centre for the Empretec Programme in India – the Empretec India Foundation. In total, 19 participants from the RDCBSM, the AICMA and the UCPMA attended the workshop.

Focus area

The Empretec programme aims to promote a culture of entrepreneurship in developing countries and those whose economies are in transition, in keeping with the UN's values, principles and methodology. The specialised workshop provided exposure to a behavioural approach to entrepreneurship and focused on business behaviours, decision-making and habit-formation. The two-day training provided (a) exposure to cognitive biases, errors and fallacies that may adversely influence business outcome, (b) insights on the application of emotional intelligence in business performance and leadership, and (c) an introduction to Empretec's Personal Entrepreneurial Competencies. The workshop was interactive with engaging exercises and group activities, to explain business behaviour, decision-making and habit-formation for effective entrepreneurship.

Outcomes

The two-day workshop resulted in greater awareness of different philosophical and psychological principles applicable in entrepreneurial contexts, along with key competencies that are considered key to entrepreneurial success. The participants were also awarded certificates from UNIDO and Empretec.

Figure 9: Workshop on entrepreneurial competencies (July 2019)

International study tours

The international study tours were conducted to provide the management of the RDCBSM and the industry associations with exposure to the global bicycle industry. Four study tours were conducted under the project and a total of 14 representatives from the target beneficiaries participated in these study tours. The study tours comprised meetings with leading technical institutions, technology suppliers and bicycle industry associations, as well as visits to manufacturing facilities.

International Study Tour to Japan

8-13 June 2017

The study tour was conducted with the objective of establishing linkages with stakeholders of the Japanese bicycle industry and identifying potential suitable partners for activities under the project. The study tour involved meetings with the Japan Management Association (JMA) and Japan Management Consultants (JMAC), Keio University, The Ministry of Economy, Trade and Industry (METI), Japan, the Bicycle Culture Centre (Cycle museum and heritage centre), Ratio&C Cycle (Centre for made-to-order cycles, by Bridgestone), dealers and retailers of cycles in Tokyo, Tokyo College of Cycle Design, Japan Vehicle Inspection Association (JVIA), Panasonic Cycles and Bridgestone Cycles. The General Manager of the RDCBSM also participated in this study tour in which he was able to observe the wide variety (types and models) of bicycles available and sold in the Japanese market through visits to manufacturing facilities, including those for e-bikes. The study tour also introduced novel concepts such as the Bicycle Culture Centre, a museum depicting the evolution of bicycles along with a library, as a potential way to raise awareness and interest among cyclists. The concept of Ratio&C (a facility to order and build customised bicycles along with maintenance services) was also identified as a relevant idea for India.

Through the interaction with the Tokyo College of Cycle Design (TCD), RDCBSM was able to observe the importance of bicycle-focused courses: a two-year 'Bicycle Product Course' and a three-year 'Bicycle Creation Course', covering bicycle design, building and maintenance, as currently delivered by the TCD. The General Manager was also able to observe the training facilities and workshops of the college.

Through the interaction with the Tokyo College of Cycle Design (TCD), the RDCBSM was able to observe the importance of bicycle-focused courses: the two-year 'Bicycle Product Course' and the three-year 'Bicycle Creation Course', covering bicycle design, building and maintenance. The General Manager was also able to observe the training facilities and workshops of the college.

The study tour included a visit to the test lab of the Japan Vehicle Inspection Association (JVIA), the Japanese nodal institute for providing testing services for automobiles and bicycles and for inspection services for goods based on the Consumer Product Safety Act. The General Manager was able to observe the equipment available in the laboratory and the tests being performed by the JVIA, their service offerings, and the standards being followed for testing and funding modalities as a reference for the RDCBSM.

Outcomes

- The study tour facilitated dialogue between the RDCBSM and leading research and technical centres in Japan. The RDCBSM was able to gain insights on key research areas/activities of these technical centres and identify areas in which the Indian bicycle industry could solicit further support. Discussions pertaining to potential training programmes for the RDCBSM were held.
- The study tour provided an opportunity for the RDCBSM to promote its services and expertise among various stakeholders working in the Japanese bicycle industry.
- The JVIA was identified to be a counterpart to the RDCBSM in terms of service offerings and scope of work.
- Through the interaction with the Tokyo College of Cycle Design, the utility of bicycle-focused courses was highlighted. This was identified as a potential action item for the RDCBSM, as a part of its training activities.

Figure 10: Visit to the Japan Vehicle Inspection Association (JVIA) during the study tour to Japan (June 2017)

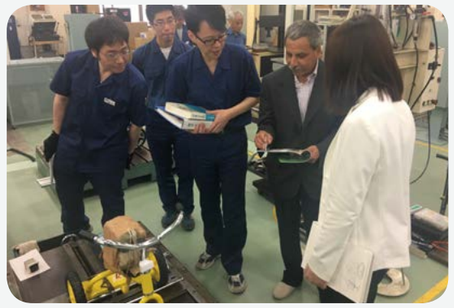


Figure 11: Visit to the Tokyo College of Cycle Design (TCD) during the study tour to Japan (June 2017)

International Study Tour to Japan

15-18 November 2017

The objective of the study tour was to participate in a workshop organised for consultations with relevant stakeholders from the Japanese bicycle industry, in context of the ongoing bicycle project. The delegation included the Director of Industries and Commerce (DIC), Government of Punjab[7] and the General Manager[8] of the RDCBSM.

The workshop was coordinated by the Japan Management Association (JMA) and witnessed participation from several Japanese organizations: the Tokyo College of Cycle Design (TCD), the Japan Vehicle Inspection Association (JVIA), Mr. Takashi Nagahori (noted bicycle industry expert, Chairman O&M Co. Ltd. and former production director of Maruishi Cycles) and Panasonic Cycles. The workshop included a presentation by the DIC, Government of Punjab, reflecting the status of the Indian bicycle industry and the RDCBSM, a presentation by UNIDO providing a brief overview of the project and an overview of the Japanese bicycle industry by Mr. Nagahori. There was also a detailed discussion pertaining to potential modalities and topics for knowledge-transfer interventions planned under the project.

The DIC, Government of Punjab and the General Manager of the RDCBSM were also given the opportunity to interact with members of the Japanese media wherein issues such as the technology requirements of the Indian bicycle industry, the potential areas of collaboration with Japanese technology suppliers and companies and the Industrial Policy of the State of Punjab, India, were all brought to the fore.

The study tour also comprised visits to the Tokyo College of Cycle Design and the Japan Vehicle Inspection Association (JVIA) for detailed discussions pertaining to their respective service portfolios and potential areas for collaboration with the RDCBSM.

Outcomes

- As an outcome of the discussion held during the consultation workshop, it was decided that a mission of Japanese experts to Ludhiana would be conducted with the objective of assessing the prevalent production and quality management practices in the Indian bicycle industry.
- Several potential modalities for the provision of support and knowledge transfer by the Japanese stakeholders were identified that would be useful for the RDCBSM.
- The representatives of the Punjab State Government and the RDCBSM's visit was covered in the Japanese media, facilitating the promotion of the Indian bicycle industry.

[7] The DIC, Government of Punjab is also the Chairman of the Governing Council of the RDCBSM.
[8] A new General Manager of the RDCBSM was appointed in November 2017, following the superannuation of the former position holder in October 2017.

Figure 12: Consultation workshop with the Japanese bicycle industry stakeholders during the study tour to Japan (November 2017)

International Study Tour to China

01-03 July 2018

The objective of the study tour was to participate in consultation meetings with the Chinese bicycle industry stakeholders. The study tour included participation in the Asia Bike and Outdoor Show 2018 in Nanjing, China, meetings with and visits to bicycle testing laboratories - the National Centre of Supervision and Inspection on Light Electric Vehicles (CEVT) and the Kunshan Products Safety Inspection Institute (KBTC), and discussions with two Chinese bicycle manufacturers – Forever Bicycles and Phoenix Bicycles. The delegation comprised representatives from the AICMA, the UCPMA and the RDCBSM: Secretary General - AICMA, Co-Convener - AICMA Technical Committee, Senior Vice President - UCPMA, Senior Member and Advisor to the Executive Committee - UCPMA and Manager - RDCBSM.

The visit to the Asia Bike and Outdoor Show 2018 provided the delegation with exposure to various types of bicycles, bicycle components and relevant accessories produced and sold by Chinese manufacturers. The show focuses on high-end bikes, sports bikes, urban bikes, cycling apparel and bike components, and the delegation was able to observe product-displays of several leading brands.

The study tour comprised visits to two leading bicycle test labs:

Firstly, the National Light Electric Vehicle and Battery Product Quality Supervision and Inspection Centre (CEVT) is a national-level inspection centre established by the State Administration of Quality Supervision, Inspection and Quarantine and specialises in the quality inspection of electric vehicles and battery products. After a detailed tour of the facility, the delegation discussed the testing and certification of batteries, motors and controllers for e-bicycles, and the standards being followed by the lab. Modalities for future cooperation such as inter-lab comparison of test results and comparison of different standards for e-bikes were also discussed.

Secondly, the Kunshan Product Safety Inspection Institute (KBTC) is approved as the national key laboratory by General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China. The KBTC is accredited by the China National Accreditation Service for Conformity Assessment (CNAS) and is well-equipped with testing facilities for bicycles and bicycle parts as per various international standards. The KBTC was found to be similar to the RDCBSM test lab in terms of scope and the delegation was able to discuss in detail the KBTC's advanced facilities for reflector testing, chemical/environmental testing, testing for accessories such as helmets as well as extensive fatigue/dynamic testing of bicycle components.

The delegation also visited two of the largest Chinese bicycle manufacturers in Shanghai, China. Discussions were held with each of the companies regarding the type of components produced in-house by the company, tie-ups with research/technical institutions for product design and development, production technology for critical components such as derailleurs and freewheels, decals for bicycles as well as new/emerging bicycle models. The Chairman of the Shanghai Bicycle Association was also present at the meeting.

Outcomes

- The RDCBSM was able to identify areas of future collaboration with the two test-labs visited, and signed joint declarations with both labs for continued cooperation in the area of testing electric bicycles.

» The delegation received insights on the bicycle industry from the Chinese manufacturers visited. The main needs of the Indian bicycle industry were identified as: strengthening the capacity of component manufacturers, strengthening a training institution for bicycle technology, and modular factories for technology demonstrations.

» Upon return, the Indian industry associations disseminated the main observations and new trends/technologies observed among its members through a meeting.[9]

» The delegation observed separate and safe two-wheeler lanes for low-speed vehicles including bicycles on most roads in China, as well as the operation of the public bike sharing system. This would provide a benchmark for implementing similar practices in India.

[9] Refer to news articles under Annex V.

Figure 13: Visit to the Asia Bike and Outdoor Show 2018 during the study tour to China (July 2018)

Figure 14: Exposure to new bicycle models and technologies through visits to cycle manufacturers during the study tour to China (July 2018)

International Study Tour to Belgium, Portugal and Germany

03-07 December 2018

The study tour aimed at giving the Indian bicycle industry representatives (from the AICMA and the UCPMA) exposure to best practices of the European bicycle industry. The meetings/visits included interactions with a variety of stakeholders – European industry associations/federations involved in technical, policy and legislative advocacy, manufacturing facilities, bicycle testing labs, a leading bicycle trade journal, as well as a representative of the European Parliament. The delegation comprised the Secretary General, AICMA, two members of the AICMA's Technical Committee and three members of the UCPMA.

The delegation met with representatives from the European Cyclists' Federation (ECF), Belgium, an organization that works towards promoting cycling as a sustainable and healthy means of transportation and recreation. While its core focus is cycling advocacy, its activities are quite multifaceted and include but are not limited to: organising the premier international planning conference on cycling entitled 'Velocity'; the coordination of the 'World Cycling Alliance', an initiative to build a global network of non-governmental organizations with a substantial interest in promoting cycling; as well as the development of detailed reports such as the 'EU Cycling strategy', a policy-review document comprising recommendations for delivering green growth and effective mobility in 2030, together with the European industry association. The delegation was able to discuss the implications of key cycling trends such as public bike sharing, cargo bicycles and their utilisation in the transport and delivery of goods, the development of cycling highways and the onset of e-bikes, gaining insights about how each of these were being handled in the EU.

The delegation also met with the World Bicycle Industry Association, whose Secretariat is currently hosted by the Confederation of the European Bicycle Industries (CONEBI) in Belgium. During the meeting, the UNIDO delegation received detailed insights into the functioning of both the CONEBI and the WBIA. The representatives of the AICMA and the UCPMA were keen to understand the main functions of the CONEBI, which include but are not limited to technical deliberations for standards and regulations, inputs for EN and ISO standards, monitoring the EU internal market, issuing market reports, coordinating the 'Industry4Europe' alliance and representation in international trade fairs/events. The WBIA was formed in order to have a globally weighted representation at UNECE's World Forum for the Harmonization of Vehicle Regulations in Geneva. As the WBIA's newest full-time member, the meeting provided the AICMA an opportunity to undertake detailed discussions pertaining to the WBIA's current activities and insights from the Indian market. To understand the legislative process of regulations pertaining to the bicycle industry, the delegation also visited the European Parliament and attended a meeting with the Committee on Transport and Tourism.

The delegation interacted with the Portuguese bicycle industry association (ABIMOTA), which coordinates among its member companies, delivers vocational training programmes, manages a bicycle test lab (LEA) and participates in promotional events/trade fairs. The ABIMOTA is also the headquarters of 'Portugal Bike Value', an initiative to establish Portugal as a destination for bicycle production with high accuracy and technical quality, comparable to India's 'Cycle Valley' in Ludhiana. The potential modalities of cooperation in the areas of battery manufacturing and a comprehensive strategy for developing a public bicycle-sharing system (including associated infrastructure and components) were discussed.

The delegation visited the manufacturing facilities of several bicycles and parts manufacturers in Portugal and Germany:

1. Buechel (Fulda, Germany): a components manufacturer producing frames and forks, pedals, hubs, rims, spokes and nipples, bells, fenders, luggage racks and baskets, lighting systems and reflectors, saddles, handles, trim nuts and other accessories.
2. Miranda Bike Parts (Agueda, Portugal): a components manufacturer for mid-range and high-end bicycles, including cold forging aluminium and v-brakes and brake levers, crank-sets, chainrings, bottom brackets, seat posts and hydraulic bicycle brakes, as well as a plastic injection facility.
3. Polisport (Agueda, Portugal): a company manufacturing plastic parts for off-road machines, headlights, handguards, body protectors, mudguards, water bottles, helmets and various other accessories.

Outcomes

- The CONEBI, the AICMA and the UCPMA signed a joint declaration for continued collaboration and information-sharing. Since the CONEBI was formed by the merger of the former European associations for bicycles and bicycle components respectively, the structure and functions of the federation were seen to be important examples for the Indian associations.
- The Indian associations also benefited from exposure to the modus operandi of global and regional industry associations, including insights pertaining to services offered and institutional arrangements. In particular, the advocacy function carried out by the ECF was seen to be an apt model to be followed to protect cyclists' interests in India.
- The AICMA and the ECF signed a joint declaration for continued cooperation to promote cycling on multiple fora.
- ABIMOTA LEA, the bicycle testing lab of the Portuguese industry association, was identified as an important partner and resource for the RDCBSM. The two labs signed a joint declaration for continued dialogue, inter-lab comparisons of test results and support for the RDCBSM.
- The Indian bicycle industry as well as the activities of the industry associations were actively promoted on various international platforms, including 'Bike Europe'[10], the leading trade journal for the bicycle industry.
- The Indian industry representatives were able to discuss how the 'Portugal Bike Value' initiative would function, its priority areas (warehousing, logistics, painting, assembly and batteries for e-bikes) and strategies, enabling them to compare and contrast the preparation for the planned 'Cycle Valley' of Ludhiana (Punjab).
- The discussions with various technical and legislative stakeholders also shed some light on the pros and cons of voluntary and mandatory standards and regulations. The Indian delegation learned that at large, European standards are made mandatory through different directives (e.g. the European Directive for General Product Safety) and national safety laws.
- The visits to manufacturing facilities enabled the delegation to observe several cutting-edge practices, such as the production of reflectors (including the preparation of the raw material polymer), automated machines for components production, superior warehousing practices and in-mould plastic decals, for potential adoption in Indian factories.

[10] ‹https://www.bike-eu.com/industry-retail-organizations/nieuws/2018/12/indian-industry-delegation-visits-conebi-and-portugal-bike-value-10134951›

Figure 15: Meeting at CONEBI (Belgium) during the study tour to Europe (December 2018)

Figure 16: Visit to a bicycle component manufacturing facility in Germany during the study tour to Europe (December 2018)

International Fellowship Training

The aim of the fellowship training was to provide advanced technical training to the RDCBSM engineers in key focus areas, to facilitate exposure to international best practices and gain hands-on experience. The fellowship training was conducted in 3 batches, in the following areas:

1. Bicycle frame building at The Bicycle Academy, United Kingdom

2. Bicycle testing at the EFBE Prüftechnik, Germany

3. Electric bicycles by the Light Electric Vehicle Association (LEVA), United States of America

Specialised international institutions were engaged to deliver the training programmes, who delivered theoretical training in an interactive classroom setting as well as applied training at their respective laboratories and workshops. The nominated trainees also received certificates on completion of the specified training programmes. The RDCBSM has also established long-term working relationships with these technical institutions for future guidance and curricula development.

International fellowship training at The Bicycle Academy (TBA), United Kingdom

01-12 October 2018

The participants of the training included four engineers from the RDCBSM. The customised fellowship training programme was conducted at The Bicycle Academy (TBA), United Kingdom, a leading technical institute that provides bicycle frame-building courses, skills masterclasses and tools. The ten-day training covered topics such as bicycle design and metallurgy, TIG welding, fillet brazing, bicycle frame fabrication, bicycle frame finishing and alignment and bicycle assembly. The objective of the exercise was to give the RDCBSM participants hands-on experience in constructing a bicycle, to familiarise them with the design-to-prototype process, as well as the key factors to be considered therein.

The participants were trained in basic design considerations such as: the main dimensions of a bicycle (i.e. saddle height, saddle setback, handlebar reach and handlebar stack); how to determine optimal ergonomics for rider comfort; and bicycle/component geometry. Factors such as structure, stiffness and strength were also explained and discussed in detail as well as vehicle handling, material selection and component integration.

The training laid special emphasis on the fundamentals of metal joining techniques, i.e. brazing (capillary and fillet) and welding (TIG). The participants were taught how to braze and weld, along with indications of key differences between the two methods, the working of the torch, behaviour of filler material, heat sources, sources of contamination, machine settings, failure modes for joint design/material selection and safety precautions. The course also covered the mitering of top and down tubes.

The main focus was on the fabrication of a frame by each of the participants. The trainers guided the participants in constructing a frame, using the techniques covered in the course (brazing, welding, mitering, jigs) and checking its alignment with the help of a fixture. Following this, the frame was fitted with other bicycle components (e.g. tyre tube, saddle, fork, front and rear tyres, front and rear disc brakes, handlebar, gear train, crank wheels) to construct a complete bicycle.

Key learnings

The participants gained in-depth understanding of key mechanical performance metrics of metals commonly used in bicycle frame fabrication (e.g. steel, titanium and aluminium). Under design and geometry considerations, the participants were introduced to measurements and concepts such as the ‘straight line stability of the wheelbase’ and trail (i.e. rotational stability about the steering axis).

The participants also learned how to operate the ‘BikeCad Pro’ design software, learning the steps involved as well as critical dimensions needed to make a frame.

Through a step-by-step practical tutorial, the participants learned how to weld and braze tubes together. Processes to control molten filler material between two flat surfaces when joining them, straight line and tube fillet brazing, capillary brazing techniques, silver brazing drop outs and temperature control while brazing were covered.

Special attention was given to carrying out TIG welding, a technique that has been identified as a key production process to be adopted for alloy bicycles. The participants learned the control of TIG welding variables and how to use them in order to maintain consistent delivery of heat energy to the work piece, machine settings, material preparation as well as performing different types of welds.

The participants were also able to learn bench fitting, set-ups for jigs and simple hand tools and their calibration. Each participant was given the opportunity to calibrate a jig set-up with a laser. The training also covered the importance of fixtures, the acceptable levels of tolerance and how to interpret working drawings to accurately set up and reference relevant fixtures.

During the bicycle assembly process, the participants gained a functional understanding of how to prepare frames for interface with standard components, i.e. the installation of drivetrains, crank-sets, disk brakes adjustment and head sets. Knowledge of the installation of these critical components is important in order for Indian manufacturers to produce premium, high-quality bicycle models.

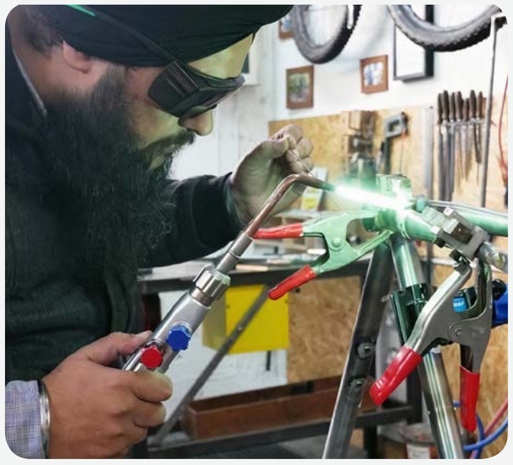
Outcomes

The four RDCBSM engineers were awarded certificates for undergoing the frame-building course.

On completion of the training, the RDCBSM acknowledged the utility of setting up a workshop for prototype development of bicycles/frames. Such a facility would not only aid the delivery of customisation services to the industry, but also allow the RDCBSM to deliver advanced design and development courses, similar to The Bicycle Academy.

The training was concluded with a bicycle design exercise. A performance evaluation reflected that the participants had become much more familiar with the hierarchy of design decisions and the factors that could influence the design and production of a bicycle frame. They also demonstrated an understanding of how the standards required by components may inform the design process in the early stages.

Figure 17: Participants working on their prototypes during the fellowship training at The Bicycle Academy (October 2018)



International fellowship training at the EFBE Prüftechnik, Germany

25 February – 08 March 2019

Three engineers from the RDCBSM were trained in this fellowship programme. This training was designed for the RDCBSM's bicycle test lab staff to increase their proficiency in the testing they currently carry out, as well as providing exposure to newer, advanced testing procedures. The training was conducted at the EFBE Prüftechnik, a leading test laboratory and test machinery provider to the bicycle and e-bike industry world-wide, with bases in Waltrop, Germany and Taichung, Taiwan. As the Managing Director of the EFBE had conducted the workshop on standards for the bicycle industry (June 2017), the EFBE experts were already aware of the existing capacities of the RDCBSM and the areas for improvement. The training programme was thus designed accordingly.

The training discussed the complete scope of the international standard pertaining to the safety and performance requirements for the design, assembly, and testing of bicycles and sub-assemblies—ISO 4210 (parts 1 to 9). All the relevant tests were set up by the RDCBSM participants in the EFBE test lab under the supervision of the EFBE engineers.

The ten-day training covered: different categories of modern, high-end sports bikes; descriptions and documentation of test samples with their sub-assemblies; tests and inspections of complete, assembled bikes (according to ISO 4210); visual inspection and crack detection methods; dynamic and fatigue tests for specific components; common mistakes in test execution and good lab practice. The practical tests were conducted on modern high-end bicycles and EPAC components as well as a typical cross-country MTB provided by the EFBE. The training also included a visit to a German manufacturing facility and its in-house test lab for further exposure.

Key learnings

The participants were able to carry out key test procedures on bicycles and components made of newer, superior materials such as aluminium alloy and carbon fibre, allowing them to observe material behaviour and the required adjustments to test parameters. This was an important learning area, as highlighted in the diagnostic assessment. The RDCBSM engineers learned practical lab set-up practices, correct testing procedures, demonstrations and key considerations for the following:

- Tests and inspection of complete, assembled bicycles
- Machine and track tests for brakes
- Static and dynamic tests for handlebars and stems
- Fatigue and impact tests for frames
- Dynamic, static and impact tests for forks
- Function, disassembly and failure modes for suspension forks
- ISO 4210 tests and UCI impact tests on high-end carbon road bike wheels
- Static and dynamic tests for drive systems (crank-sets and EPAC drive units)
- Static and dynamic tests for saddles and seat-posts

The RDCBSM engineers were able to observe and learn new tests that are currently not being carried out at their test lab, such as the 'Heat Resistance Test' for complete bicycles. In addition, the engineers learned about crack detection methods such as the 'Dye Penetrant Spray Method' and the 'Dye Penetrant Marker Method'. These techniques were highlighted as a training requirement during the diagnostic assessment.

The participants also gained exposure to tests beyond the ISO 4210 standard, such as the EFBE's proprietary 'TRI-TEST'.

Outcomes

The three RDCBSM participants received certificates of completion of training from the EFBE.

The main outcome of the training was that personnel from the RDCBSM's test lab gained experience in testing bicycles and components of newer, alternative materials (such as aluminium alloy and carbon fibre), allowing them to better support Indian manufacturers upon return. The step-by-step training also allowed for the identification and correction of mistakes in testing procedures in the RDCBSM lab. The EFBE provided the participants with sample test reports, to be used as a reference for the RDCBSM.

The RDCBSM engineers identified additional tests that could be added to their testing service portfolio, such as 'Carrier Fatigue Testing' and the EFBE's proprietary 'TRI-TEST', a reference test that provides a time-lapse simulation of the stresses throughout a bike's entire life.

Both centres signed a joint declaration towards the continued provision of support from the EFBE to the RDCBSM's testing-related endeavours.

International fellowship training by the Light Electric Vehicle Association (LEVA), U.S.A

18 February – 01 March 2019

The fellowship training was delivered by international experts from the Light Electric Vehicle Association (LEVA), U.S.A., at the RDCBSM premises in Ludhiana.[11] The experts who conducted the training included Mr. Don Gerhardt (Director – Training, LEVA) and two LEVA instructors: Mr. Mark Smith and Dr. Jack Martin. Ten participants from the RDCBSM and four participants from the industry associations underwent the training. The objective of the training programme was to develop capacities at the RDCBSM to carry out testing and deliver training programmes in the area of electric bicycles. The training programme focused on (i) batteries, (ii) motors, (iii) controllers, and (iv) complete bicycles. The two-week training programme was divided to focus on the RDCBSM in week 1 (including management strategies), and subsequently deliver technical training during week 2 (including participants from industry) so that all participants could be certified as LEVA instructors on completion.

The training covered theoretical and practical aspects of testing e-bike components and setting up test stations and requisite software for controller-display-sensor systems, batteries and chargers, motors and complete e-bike data logging. The training was designed to be practical, such that the participants would be adept at making the necessary wiring connections, running test equipment and recording/analysing data for performance checks of different e-bike sub-assemblies. The training also comprised discussions/planning to develop test procedures for complete e-bike testing, water ingress protection testing, and how to record meaningful data and issue reports for various components. Testing equipment for the test stations was provided to the RDCBSM for future use.

Key learnings

The training provided participants an introduction into basic electrical theory. As a majority of the RDCBSM personnel had a background in mechanical engineering, the experts explained the basic power, energy and voltage-related concepts necessary to understand connections, component behaviour and quality benchmarks.

As the e-bike segment is in the nascent stages in India, the training gave the participants an in-depth explanation of the different types of e-bikes and drive systems, e-bike classifications, the main components, hardware and software of different e-bike systems as well as design considerations and implications deriving thereof. The experts paid special attention to e-bike batteries, motors, sensors and controllers, conducting several reverse engineering and connection exercises to increase the participants' familiarity with these systems.

The training focused on basic test procedures to check the performance of several e-bike components, as highlighted below:

- **Batteries and chargers**: Testing using a Computerized Battery Analyzer (CBA) and a 500W amplifier for batteries up to 48V. The accompanying software was also installed and operationalised.

[11] The international fellowship training was originally going to be conducted at LEVA, U.S.A. However, the four nominated participants were unable to get U.S. visas, and the training was therefore reorganised in India. This arrangement allowed for additional participants to receive the planned training.

- **Motors**: Testing a front-geared hub motor on a wheel truing stand and recording the acquired data.
- **Controllers and throttles**: Testing of different motor controllers and thumb/twist throttles using a Controller-Motor-Throttle (CMT) tester.
- **Complete bicycles**: Logging data for a complete running e-bike using a 'Cycle Analyst', a digital dashboard that calculates the instantaneous electric power, speed/distance/time, energy gained from regenerative braking, peak currents and voltage, total battery cycles and many other additional features.

The participants were also taken to visit and interact with e-bike manufacturing units in Ludhiana. A walk-through of the production process enabled them to understand several nuances of e-bike production/assembly and identify potential areas of support by the RDCBSM. The participants from the RDCBSM were also trained in the delivery and analysis of 'Voice of the Customer' surveys.

Outcomes

A total of fourteen participants received training and certification to teach the 'LEVA E-Bike Technician' course to other manufacturers and interested candidates from the Indian bicycle industry.

The training resulted in an expansion of the RDCBSM's service portfolio. Not only does the RDCBSM have LEVA-certified instructors to deliver training programmes on e-bikes, but with due accreditation/calibration the RDCBSM can also offer basic-testing/performance-check support to manufacturers for e-bikes and their components. The training programme also provided the RDCBSM with basic tools and equipment for this.

The experts from LEVA also facilitated network development with leading technology suppliers for e-bike motors, batteries and test equipment shared during the training programme. This would enable the RDCBSM and interested companies to develop suitable collaborations for future production and technology transfer.

During the training programme, the LEVA experts also developed a five-year strategic plan for the RDCBSM to become a 'centre of excellence' for testing and training in the area of e-bikes. This document and the action items therein provide a good reference for short-to-medium term planning for the RDCBSM.

At the end of the training, the RDCBSM and the LEVA signed a joint declaration capturing their intent to continue working together to support the Indian bicycle industry for the development, manufacturing and testing of e-bikes. The RDCBSM and the LEVA also plan to work together for the joint development of tests for e-bikes such as road tests (top speeds, acceleration, pedelec operation), battery tests and hub motor water ingress tests.

Figure 18: Analysis of e-bike batteries during the LEVA fellowship training (February 2019)

Figure 19: Setting up of testing equipment during the LEVA fellowship training on e-bikes (February 2019)

Hands-on Training

The diagnostic assessment found that the technical personnel of the RDCBSM had limited operational and production-process experience at the shop-floor. This gap was addressed by hands-on, practical training programmes at manufacturing facilities and test labs. These activities were designed combining the learning-by-doing approach with observation of real-time manufacturing processes alongside international experts.

Bicycle testing

23 June 2017

This training was conducted by international expert Mr. Marcus Schroeder, from the EFBE Prüftechnik, in conjunction with the workshop entitled 'Standards for the Bicycle Industry' in June 2017. The hands-on session was conducted in the bicycle test lab of the RDCBSM, with the objective of the international expert training the participants in conducting some key mechanical tests of bicycles/components and international best practices in testing. The training aimed to cover tests such as the 'Back Pedal Braking System Strength Test', the 'Crank Assembly Fatigue Test' (at 30° and 45°), the 'Seat Post Fatigue and Static Strength Tests', the 'Transmission Test' (for chain, wheel and crank assembly and free wheel and chain), tests for handlebars and stems, security tests for the brake block and brake pad assembly and the 'Hand-operated Braking System Strength Test'.

During the session, the expert not only shared correct testing procedures, but also identified and suggested corrective measures for some errors identified, such as:

- Fixing of force application for pedalling forces fatigue test, frame and drive/crank system (according to ISO instead of 180° phase shift).
- Ensuring that linear and rotational degrees of freedom are maintained.
- Ensuring that all load cells are free of radial loads, shear stress and any torques.
- Verifying the indication on the control unit (e.g. +/- 10 N) when load cells and torque sensors are free.

Figure 20: Hands-on training in bicycle testing at the RDCBSM (June 2017)

Quality audits

14-19 February 2019

The diagnostic assessment found that there is limited awareness regarding the different principles of product/process quality management and the advantages of integrating such principles in their operations in the Indian bicycle industry. To support manufacturers in this area, the RDCBSM should be in a position to conduct on-site assessments of production operations of bicycle manufacturers and provide efficiency and production improvement guidelines.

To address this problem, a team of Japanese experts visited the bicycle cluster in Ludhiana to assess the status of bicycle manufacturing in India as well as understand the current quality management practices. The team comprised Mr. Kazunobu Tokuda and Mr. Takashi Nagahori.

The experts, along with key personnel from the RDCBSM, visited bicycle and bicycle parts manufacturing companies in the Ludhiana cluster. The team met with key management personnel from the companies visited. They undertook plant visits to assess/audit the production quality and efficiency levels of Indian bicycle manufacturing companies and gain an understanding of the prevalent production levels and quality. The experts assessed each of these plants in areas such as quality, technology used, costs and productivity, delivery, work site management and training/leadership. The plants visited were evaluated in each of these areas and then compared to best practices in a model Chinese bicycle manufacturing unit. The RDCBSM team was able to observe and learn from the experts' audit processes and evaluation criteria. A comparative table of the results and key performance indicators used are provided in the table below.

Table 5: Key performance indicators used for a quality audit

Audit Item		China	Indian Co. A	Indian Co. B	Indian Co. C	Indian Co. D	Indian Co. E	Indian Co. F
Cost/ Productivity	Defect rate level	15	8	6	13.5	3	9.5	3
	Inspection system level							
	Standardisation level							
Delivery	Machine utilisation level	14	13.5	11.5	13	4	7.5	5
	Labour performance level							
	Layout							
Technology	On time delivery level	13.5	11	11	10.5	4.5	10	5
	Stock level							
	Synchronisation level							
Work site management	Automation level	14	11	10	14	2.5	6	2
	IT utilisation level							
	MC maintenance level							
Training/ leadership	5S level	14	9	9	14	3	6	3
	Visualisation level							
	Improve activity level							
Training/ leadership	Discipline level	8	6	6	8	3	5.5	3
	Work site atmosphere							
Total		78.5	58.5	53.5	73.0	20.0	44.5	21.0

Bicycle assembly

14-15 February 2019

The hands-on training session was conducted by international expert Mr. Lucas Elrath, from Robson Forensic (U.S.A.). The session covered an overview of the theory and use of bicycle-assembly tools, including torque wrenches and lubricants, using samples for identification and explanation. This was followed by the procedures and best practices regarding frame inspection and alignment, finishing, and preparation for final assembly using different frame models. The expert covered considerations and best practices of final assembly for bicycles, explaining different sub-assemblies and component systems such as clamped components (including control cables and housing), brake system components, shifting and drivetrain components, and wheels, using different product samples and models.

The main assembly-focused training was conducted at an assembly line in a factory, for multi speed bicycles. The steps carried out by each worker to assemble and pack bicycles were analysed. Special focus was given to improving the quality of adjustment for cable-operated braking and shifting systems. The expert worked with the plant team and the participants to identify any changes, additions or modifications to the current steps of assembly to increase per-unit output while reducing the failure rate. The expert suggested changes pertaining to the creation of jigs and fixtures that would allow for faster and more accurate installation of shifting components, worker equipment and workflow to eliminate unnecessary errors in tool use and increase worker efficiency.

Figure 21: Hands-on training on frame alignment and bicycle assembly (February 2019)

Twinning

Another important activity of the project was to facilitate twinning of the RDCBSM, the AICMA and the UCPMA with leading international counterpart organizations working in the bicycle industry. Such twinning was envisaged to increase the cooperation and collaboration between the Indian and international actors, achieving continued knowledge and experience sharing, the transfer of best practices and technologies to India, and India's participation in global platforms/projects for the bicycle industry.

The RDCBSM, the AICMA and the UCPMA signed several **joint declarations** with international bicycle test labs and industry associations, capturing their intention to work together in the future.

The RDCBSM signed joint declarations with the following international test labs:

1. National Centre of Supervision and Inspection on Light Electric Vehicles and Battery Products Quality (CEVT), China

2. EFBE Prüftechnik GmbH, Germany

3. Light Electric Vehicle Association (LEVA), U.S.A.

4. Kunshan Products Safety Inspection Institute (KBTC), China

The RDCBSM and the AICMA also signed a joint declaration with the National Association of Two Wheels Industries, Hardware, Furniture and Related Products (ABIMOTA), Portugal, focusing on continued cooperation with ABIMOTA's test lab.

The joint declarations state that the RDCBSM and the respective partners would work together in the area of testing and quality control for bicycles and electric bicycles, as applicable, through modalities such as:

- Exchange of information pertaining to testing, certifications, research, development and demonstration of new developments/trends in the bicycle value chain.
- Discussions and information-sharing pertaining to new standards vis-à-vis tests for bicycle manufacturing or field tests.
- Inter-lab comparison of test results to verify proficiency of testing, as applicable and necessary for both organizations.
- Participation in staff exchange programmes and participation in each other's conferences and symposia, as applicable.

The AICMA and the UCPMA signed a joint declaration with the Confederation of the European Bicycle Industries (CONEBI) to work together in the areas of promotion of cycling and requisite infrastructure, regulations and standards for bicycles and bicycle parts and the adoption of latest manufacturing technologies and processes for bicycle production. The modalities to leverage their collective expertise and outreach for the growth and development of the Indian and European bicycle industries include:

- Exchange of information pertaining to new developments/trends in raw materials, components/parts and sub-assembly of bicycle manufacturing and best international practices, cleaner technologies and cost reduction solutions.
- Exchange of technical material and publications.
- Participation in personnel-exchange programmes and participation in each other's conferences and symposia, as applicable.
- Organisation of collaborative consultative meetings and seminars for topics of mutual interest.
- Facilitation of company-to-company collaborations, as applicable.
- Cooperation and complementary action on global common issues of the bicycle value chain and promotion of sustainable transport at various international fora.

The AICMA also signed a joint declaration with the European Cyclists' Federation (ECF), recognising the need for efforts towards the promotion of cycling and cohesive advocacy initiatives in the bicycle industry. The joint declaration highlights the need for the exchange of information on new developments/trends in bicycle products and the creation of seamless cycling networks, cycle usage technologies, cyclists' safety aspects and recycling; spreading joint awareness of the benefits of cycling (in terms of energy, pollution, health, congestion and affordability) as well as the promotion of sustainable transport vis-à-vis enabling conditions in various countries through model frameworks at UN bodies and other international organizations. The joint declarations are attached in Annex III.

Procurement of Testing Equipment

The capacity building phase of the project also comprised procurement of equipment for the RDCBSM's testing facility. At the time of project conceptualisation, the RDCBSM provided the DPIIT with a comprehensive list of items needed to upgrade its laboratory to the international level of compliance, as also supported by requests from the industry. The list of equipment to be procured under the project originated from this list, which included:

1. Equipment for RoHS, EEV testing
2. Spectrometer
3. Universal testing machine 1000 KN
4. Plastic and rubber testing machines
5. Retro-reflection measuring unit
6. Goniometer
7. Tristimulus Calorimeter

Figure 22: Reflector testing facility set-up at the RDCBSM

During the course of the project, the RDCBSM revised the list of equipment, catering to the changing requirements of the industry. It was expressed that while some of the listed equipment had already been obtained by the RDCBSM in the time between project formulation and final approval, there was a need to expand the scope of the testing equipment pertaining to compliance as per RoHS and REACH directives, to meet export requirements. The equipment list was thus modified accordingly, and the final equipment procured under the project included:

1. Equipment for ROHS testing, including:
   - Energy Dispersive X-ray Fluorescence Spectrometer
   - Pyrolyzer – Gas Chromatograph-Mass Spectrometer (Py-GCMS)
   - UV – Visible Spectrophotometer
2. Optimal Emission Direct Reading Spectrometer (PMT)
3. Retro-reflection measuring unit
4. Goniometer (automatic)
5. Tristimulus Calorimeter

Figure 23: Optical Emission Spectrometer at the RDCBSM

The testing equipment (along with suitable accessories and software) was procured from leading international technology suppliers, installed, calibrated and commissioned, followed by a training on usage and operation for the RDCBSM staff.

Details of the equipment operationalised are provided below:

1. Reflector testing equipment
   - » Retro-reflection Measuring Unit: Equipment for the measurement of the coefficient of luminous intensity of retro reflectors
   - » Goniometer (automatic): A high precision industrial-class goniometer with a robotic arm for movement of test samples (i.e. reflex reflectors) at different angles
   - » Tristimulus Calorimeter: Equipment for simplified assessment and classification of the colours of the different types of bicycle reflectors, sheets and tapes

As a result of this procurement, the RDCBSM is now positioned to carry out testing for bicycle reflectors, sheets and tapes. The RDCBSM has received accreditation as per ISO 6742 (applicable to retro-reflective devices used on cycles) from the National Accreditation Board for Testing and Calibration Laboratories (NABL). Since the use of reflectors was made compulsory by the Supreme Court of India (India's highest statutory body) in 2016, the RDCBSM's reflector-testing facility has been an important resource for Indian manufacturers producing and importing bicycle reflectors.

2. Optical Emission Spectrometer: Equipment to determine the elemental composition of a broad range of metals. This has further strengthened the analytical support services that the RDCBSM can provide to the bicycle industry.

3. Restriction of Hazardous Substances (RoHS)/Registration, Evaluation, Authorisation and restriction of Chemicals (REACH) compliance testing equipment:
   - » Energy Dispersive X-ray Fluorescence Spectrometer: Non-destructive test equipment to test compliance as per RoHS for five main elements – cadmium, mercury, lead, chromium and bromine.
   - » Pyrolyzer – Gas Chromatograph-Mass Spectrometer (Py-GCMS): Equipment to analyse the percentage of total poly brominated biphenyl (PBB) and total poly brominated diphenyl ethers (PBDE) in samples.
   - » UV – Visible Spectrophotometer: Equipment to analyse hexavalent chromium.

As a result of this procurement, the RDCBSM has been equipped to test for compliance as per RoHS and REACH directives. The need for this facility had been expressed by industry representatives on multiple occasions, highlighting that testing as per these directives is imperative for manufacturers looking to export their products into European markets (sample request letter attached under Annex IV).

Figure 24: Testing equipment for compliance with RoHS/REACH directives

Procurement of 3D printer

Under the project, a 3D printer was also procured for the RDCBSM. The printer is a high-performance device based on the principle of fused deposition modelling (FDM) technology, suitable for a wide range of polymer 3D printing filaments, including special engineering plastics, acrylonitrile butadiene styrene (ABS), polylactic acid (PLA), polyvinyl alcohol (PVA), nylon, wood fill, metal fill, high-impact polystyrene (HIPS) and acrylonitrile styrene acrylate (ASA). The operationalisation of this 3D printer positions the RDCBSM to provide prototyping support to the bicycle industry.

Figure 25: 3D printing facility at the RDCBSM

© Shutterstock/num_skyman

5 KEY ACHIEVEMENTS

The project interventions took a multifaceted approach to building the capacity and capability of the RDCBSM, the AICMA and the UCPMA. The project interventions have resulted in:

- Enhanced technical expertise of RDCBSM and the associations and their ability to contribute towards addressing industry-wide challenges
- Strengthening of the RDCBSM's service portfolio and support to the industry, including new testing facilities at the RDCBSM in response to regulatory and export requirements
- Expansion of the RDCBSM's and the associations' institutional linkages with international technical partners and industry actors

These outcomes would play an important role towards facilitating the adoption of modern manufacturing technologies by Indian bicycle and parts manufacturers, improvement in productivity performance and competitiveness of units and inclusion of small and medium units in global value chains.

The key achievements of the project are highlighted below.

Industry diagnostic of the Indian bicycle industry

The project facilitated the identification of the main industry-wide critical needs and the main ways in which manufacturers could be supported to enhance the competitiveness of the industry. This analysis incorporated inputs from key stakeholders, ensuring relevance to the current industry context. Indicative of their utility, the industry-wide recommendations provided by UNIDO have prompted the initiation of proposals and funding requests submitted to the government by the RDCBSM and the industry associations.

Institutional diagnostic assessment of the nodal technical institution and industry associations

The comprehensive institutional assessment provided key insights regarding general management practices, knowledge management practices, HR management strategies, collaboration with industry, areas for skills enhancement and the service portfolio of RDCBSM, as well as the functioning of the industry associations. This assessment not only provided better context for the implemented project, but would also serve as the basis of potential reorientation of the organization to meet the changing needs of the industry.

Development of an action plan and strategic framework for the RDCBSM

In order to facilitate strategic, long-term planning within the RDCBSM, the project developed a technical and managerial action plan, with short-term, medium-term and long-term recommendations. With expert guidance, strategic frameworks in specific areas were also developed for the RDCBSM: for example, a five-year strategic plan towards how the RDCBSM could position itself for the delivery of testing and training services in the area of e-bikes was developed and provided to the organization.

Technical and practical training programmes

The project facilitated a wide range of capacity building activities—technical workshops, hands-on training sessions, international study tours and international fellowship trainings. These knowledge-transfer activities have resulted in increased exposure to best available technologies and modern manufacturing processes for the RDCBSM and the industry associations. A balance between theoretical trainings as well as first-hand exposure to modern bicycle manufacturing and testing was ensured for junior, mid-level and senior engineers and industry representatives.

Certification of personnel in the area of electric bicycles

Participants of the fellowship training programmes received certificates of completion from the respective technical institutions conducting the training. Importantly, select personnel received certification from LEVA (U.S.A.) in the area of e-bikes:

- 14 personnel were certified as LEVA instructors to teach the 'LEVA Electric Bike Technician Certificate' courses (levels 1–4)
- 27 personnel were certified as electric bike technicians on completion of the LEVA course

Setting up and operationalisation of India's first reflector testing facility dedicated to the bicycle industry at the RDCBSM

The procurement of equipment to test bicycle reflectors, sheets and tapes has positioned the RDCBSM as **India's first reflector testing facility dedicated to the bicycle industry.** Through its Committee on Road Safety, the Supreme Court of India (India's highest statutory body) made it mandatory to install a set of 10 reflectors (as per ISO 6742-2) on bicycles, with effect from September 2016. Manufacturers in the Ludhiana cluster had to incur high costs for testing and greater lead times to obtain test reports through test labs located in other parts of the country. The RDCBSM is now able to address these challenges by hosting a reflector-testing facility in the bicycle manufacturing cluster in Ludhiana, offering testing services at reasonable prices.

Figure 26: Coverage of project achievement on official DPIIT Twitter page[12]

[12] ‹https://twitter.com/dippgoi/status/1085819759713607684›

Setting up and operationalisation of testing facilities at RDCBSM as per RoHS and REACH directives

The RDCBSM received requests from industry representatives to support manufacturers in meeting compliance requirements for exports to European markets. An important aspect of this was to meet the requirements of RoHS and REACH directives, pertaining to hazardous and chemical substances. The RDCBSM has now been equipped with testing facilities to check for RoHS/REACH compliance. This establishment of this facility implies substantial cost and lead time savings for the manufacturers in the Ludhiana cluster, who earlier relied on international laboratories for this service.

Table 6: Capacity building programmes of the project

Activity	No. of training programmes	No. of participants trained	Expertise from	Areas of training
Technical workshops	07	172	Germany, Italy, U.S.A, India	» Patents and IPRs in the bicycle industry » Standards for bicycles and bicycle components » Bicycle design » Electric bicycles » Material behaviour and failure analysis » Finite element analysis (FEA) for bicycles » Entrepreneurial competencies
International study tours	04	14	Japan, China, Belgium, Portugal, Germany	Interaction with and visits to leading international technical institutions, associations, testing labs, bicycle manufacturing companies for first-hand discussions and exposure
Fellowship training programmes	03	21	U.K., Germany, U.S.A.	» Bicycle frame-building » Electric bicycles » Bicycle testing
Hands-on training sessions	03	38	Germany, Japan, U.S.A.	» Bicycle testing » Quality audits » Bicycle assembly
Training to operate procured testing equipment	04	Staff of RDCBSM's bicycle testing lab	Germany, Austria	Operation of:[12] » Reflector testing equipment » Testing equipment as per RoHS/REACH directives » Spectrometer » 3D printer

[13] Details provided in the section entitled 'Procurement of Testing Equipment'.

Addition of new services to the RDCBSM's existing service portfolio

The project has contributed to strengthening the expertise and skill-level of the RDCBSM personnel and industry association representatives in a wide range of technical areas. This strengthened capacity has better positioned the RDCBSM to provide key technical inputs to industry and add additional services to its current service portfolio. Some illustrative examples are listed below:

- Testing of bicycle reflectors
- Testing of bicycle components as per RoHS/REACH directives
- Delivery of e-bike technician courses, in collaboration with LEVA (U.S.A.), following the certification of the RDCBSM personnel as instructors
- Basic checks for select e-bike components (e.g. batteries, controllers and throttles) to support manufacturers in verifying the quality of procured components
- Facilitating B2B initiatives and common sourcing of key e-bike components for the Indian bicycle industry, through established networks with technology suppliers and manufacturers of e-bike components
- The training programmes under the project have contributed towards enabling the RDCBSM to establish several additional services, such as an active consultancy service, especially for the small and medium-sized manufacturers of the bicycle cluster; support towards product development through finite element analysis and test simulations as a precursor to prototyping; product failure analysis; and general quality audits
- Provision of prototyping support to manufacturers through the newly-procured 3D printer

Expansion of international institutional networks

The various activities of the project facilitated increased dialogue with and linkages between the RDCBSM, the AICMA, the UCPMA and leading international technical organizations, manufacturing units, technology suppliers and industry experts. The RDCBSM was found to have limited contact with international partners or companies or joint ventures/collaborations with other industry actors, owing to limited knowledge of various international organizations and their areas of specialisation and lack of access to the appropriate points of contact within these organizations.

Figure 27: Select organizations of the international network developed during the project activities

Addressing this gap was one of the main advantages of UNIDO's project interventions. Through its study tours, consultation meetings, site/lab visits and training programmes, the project facilitated the RDCBSM's interaction with leading organizations from all over the world and enabled free and detailed knowledge sharing between them. The RDCBSM personnel were able to visit these organizations, observe their facilities and get trained by in-house experts. They were also able to initiate dialogue regarding sustained collaborations in the future, resulting in the signing of joint declarations with several of these organizations. Addressing this gap was one of the main advantages of UNIDO's project interventions. Through its study tours, consultation meetings, site/lab visits and training programmes, the project facilitated the RDCBSM's interaction with leading organizations from all over the world, and enabled free and detailed knowledge sharing between them. RDCBSM personnel were not only able to visit and observe their facilities and get trained by seasoned, in-house experts of these organizations, but were also able to initiate dialogue regarding sustained collaborations in the future, resulting in the signing of joint declarations with several of these organizations.

Signing of 7 joint declarations for future cooperation

As a result of the productive discussions and consultations held during the project, the RDCBSM and the associations have been able to sign several joint declarations for continued collaboration with and support from international counterpart organizations. The signed agreements include:

- RDCBSM and the National Centre of Supervision and Inspection on Light Electric Vehicles and Battery Products Quality (CEVT), China
- RDCBSM and EFBE Prüftechnik GmbH, Germany
- RDCBSM and the Light Electric Vehicle Association (LEVA), U.S.A.
- RDCBSM and the Kunshan Products Safety Inspection Institute (KBTC), China
- RDCBSM, AICMA and the National Association of Two Wheels Industries, Hardware, Furniture and Related Products (ABIMOTA), Portugal
- AICMA, UCPMA and the Confederation of the European Bicycle Industries (CONEBI)
- AICMA and the European Cyclists' Federation (ECF), Belgium

Development of technical resources

The teaching materials used to deliver the technical workshops and advanced technical training programmes have all been provided to the RDCBSM as a part of its knowledge repository. These materials will act as a key resource for subsequent knowledge dissemination to the industry and knowledge management within the organization. Several organizations and experts also provided the RDCBSM with additional reference documents and resources, based on specific expressed requirements such as documents pertaining to particular standards and regulations. Many of the individual experts have also expressed a willingness to maintain an open channel of communication with the RDCBSM for continued support and technical guidance.

6 OBSERVATIONS AND LESSONS LEARNED

© Shutterstock/Attila JANDI

During the implementation of the project, there were several factors that influenced the overall operational effectiveness. These included factors and actions that enhanced project outcomes as well as the contextual challenges faced. Some of these aspects are listed below.

Relevance of diagnostic assessment

The identification of critical industry needs through a detailed diagnostic assessment and interaction with various industry actors allowed for the selection of appropriate topics and technology areas for capacity building.

Involvement of industry representatives

The activities of the project benefitted greatly from the high level of involvement from industry units and manufacturers from the bicycle cluster in Ludhiana. The representatives of the associations as well as the management of the companies visited facilitated multiple visits to different factories in the cluster, provided detailed inputs regarding the current status and specific needs of the industry and participated actively in the different training programmes organised. Support for on-site training programmes and the provision of bicycle/component samples for demonstrations were extremely forthcoming.

Choice of participants in training programmes

The effectiveness of the training programmes was enhanced by appropriately identifying the participants and attendees.

» The inclusion of junior, mid-level and senior level personnel from the RDCBSM in the training workshops and hands-on training ensured institution-wide strengthening of the organization.

- The participation of industry representatives in the training programmes ensured that on-ground experiences and perspectives on prevalent production practices were a part of the discourse.
- Technical personnel were selected for the fellowship training programmes as per their area of specialisation.
- Senior management personnel were identified for management-focused discussions held during the study tours.

Capacity building modalities

In line with the findings of the diagnostic assessment, the training programmes were designed to (i) provide participants with exposure to shop-floor operations, and (ii) use practical teaching methods for maximum absorption, through:

- **Visits to manufacturing facilities**: The observation of real-time operations of modern bicycle manufacturing facilities and testing labs during the international training programmes and study tours provided the RDCBSM and industry representatives with shop-floor exposure, while the visits to Indian units enabled them to compare and contrast operations.
- **Hands-on training**: The capacity building activities were designed to be practical and interactive. This learning-by-doing/hands-on training approach proved to be effective and well-received by the participants.

Feedback mechanism

Collection of feedback after the training programmes ensured effective execution and responsiveness to the participants' requirements in subsequent activities.

Identification of specialised experts

Identifying and engaging suitable technical experts for project activities was found to be challenging as expertise in bicycle production is a niche area. This challenge was overcome with extensive research and outreach to different types of expert networks.

UNIDO networks

The utilisation of UNIDO's international network of offices was extremely useful in organising meetings and visits with the global bicycle industry's key stakeholders. For example, the UNIDO Investment and Trade Promotion Offices (ITPOs) in Tokyo and Shanghai were instrumental in identifying potential experts and industry partners in Japan and China, respectively.

Scheduling

While conducting training programmes at leading technical institutions, the annual calendar and availability of experts/organizations did not always align with project timelines. In addition, some junior personnel nominated from the RDCBSM for international fellowship training programmes were denied visas to undertake travel. Thus, the scheduling of training activities, especially with international partners, was prone to delays and required adaptability in the implementation plan.

Participation by SMEs

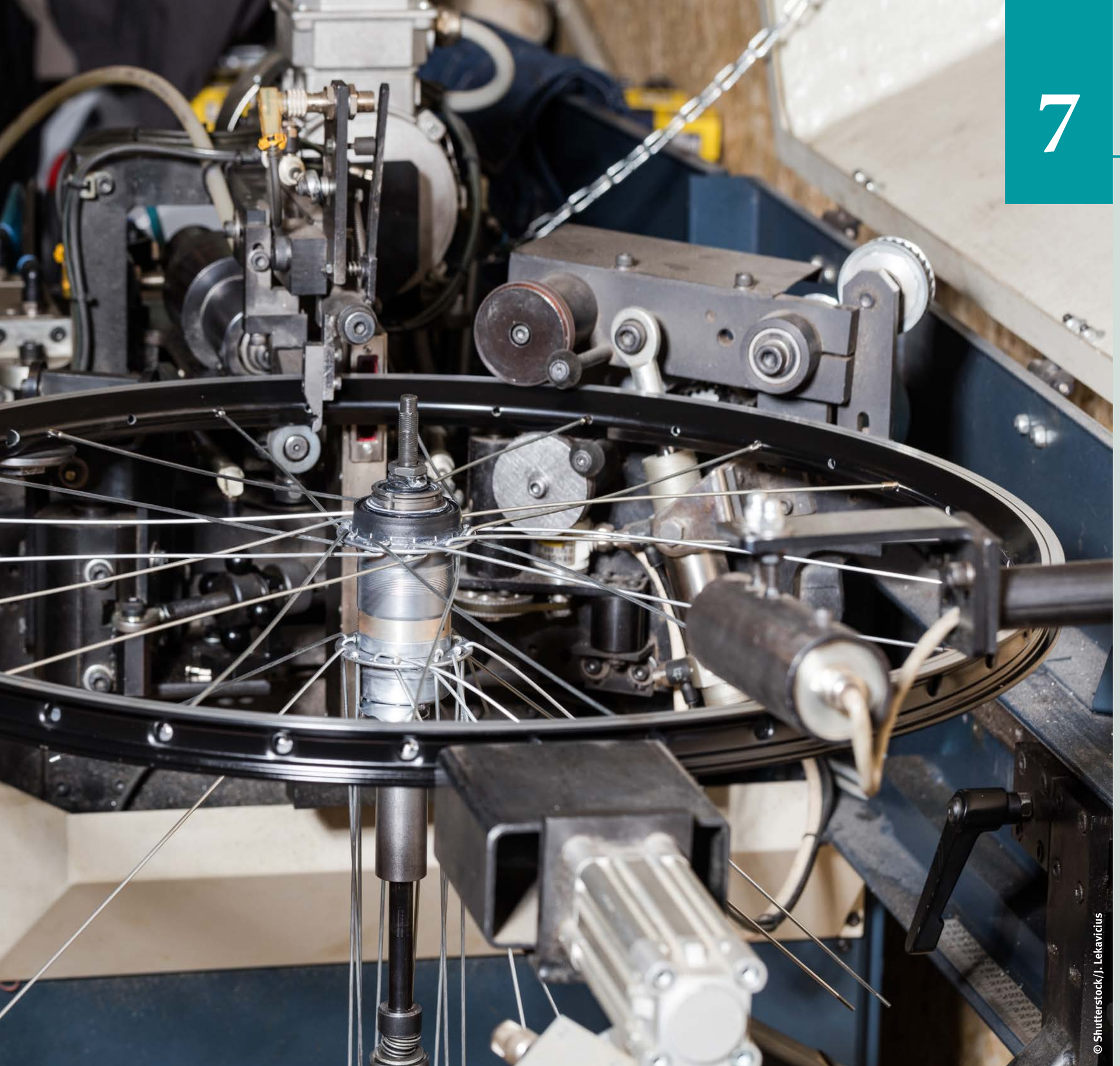
Participation in training activities by small-scale component manufacturers was limited as compared to the larger OEMs. This was found to be indicative of the focused training requirements of such manufacturers. It was also noted that greater outreach to such SMEs would be achieved by changing the medium of instruction from English to local languages such as Hindi or Punjabi.

Concept of technology transfer

It was found that traditional industry actors such as the RDCBSM are more receptive to the concept of direct 'embodied' technology transfer, i.e. technology transfer that manifests as investments in new equipment or machinery. The RDCBSM therefore had to be sensitised regarding the importance of embedding expertise within the organization (and subsequently the industry), as a manifestation of the (disembodied) technology transfer process. Accordingly, the project's capacity building activities were designed to (i) build the RDCBSM's theoretical and functional knowledge of best available technologies/processes, enabling them to adapt them to the Indian context, as well as (ii) elucidate potential services through which these techniques/best practices could be diffused in the industry.

Gender mainstreaming

While the participation of women engineers and personnel in project activities was encouraged, the target beneficiary institutions were found to have very few female employees in the technical departments or executive bodies, (this appeared to be the general case in the industry as well).



© Shutterstock/J. Lekavicius

7 EVALUATION

As one of the post-implementation activities of the project, a Final Evaluation (FE) of the project was undertaken. The evaluation was conducted by an international evaluation consultant through a comprehensive review of documents and reports as well as consultations with the main stakeholders and beneficiaries of the project.

The objectives of the Final Evaluation were:

- To assess the project performance in terms of relevance, effectiveness, efficiency, sustainability and progress to impact.
- To identify key learning to feed into the design and implementation of the forthcoming projects.
- To develop a series of findings, lessons and recommendations for enhancing the design of new and implementation of ongoing projects by UNIDO.

The Final Evaluation found that industry needs were adequately addressed by the project with high relevance and ownership of the project by the national stakeholders, which in turn, in this case, resulted in a high and active interest and participation from all the stakeholders in achieving the project outputs.

The main findings of the FE are presented below:

Project design and relevance

All the interviewed stakeholders emphasized the high relevance of the project for the bicycle sector. It was designed to address some crucial issues that the bicycle and bicycle parts industry is faced with and met the needs of the target group. The project was also consistent with the country's, and therefore donor's, priorities and in line with the National Manufacturing Policy (2011).

The outputs were considered to be adequate for an upgrading of the RDCBSM, and to achieve the expected outcome: “strengthened capacity and capability of the RDCBSM, the UCPMA and the AICMA to provide management and technical support to the Indian bicycle sector with a view to strengthen its global competitive position”.

Effectiveness at current stage of implementation

At the time of the Final Evaluation, almost all the activities were found to be completed. Within the framework of the project and its planned outputs, a report on the assessment of the bicycle sector as well as a diagnostic study, and action plans for the RDCBSM, the UCPMA and the AICMA, were prepared; the skills and technical capacity and capability of the beneficiary institutions were upgraded and equipment was procured and installed at the the RDCBSM. Achieved outputs were considered to be effective in supporting the bicycle sector and contributing towards achieving the expected outcomes of the project.

Efficiency at current stage of implementation

The Final Evaluation found that the project resources/inputs (concerning funding, expertise and time) were used economically to produce results, which were achieved within the original budget, and at an acceptable cost.

Likelihood of sustainability of project outcomes

The Final Evaluation found that the capacity -building and knowledge transfer, via training workshops as well as fellowship training programmes (along with the procurement of testing equipment) provided the RDCBSM with additional options for revenue generation from the industry. The evaluation found that the project results and benefits are expected to be sustainable after the end of the donor funding. For the long-term sustainability of the RDCBSM and its support to the micro and small enterprises in the bicycle industry, it was found to be crucial to not only maintain the acquired knowledge, but also to improve and build upon it.

Cross-cutting issues

The Final Evaluation found the overall project management by the Project Manager and the project management unit (PMU) to be effective and efficient. The PMU reported regularly to the PM at UNIDO HQ as well as to the DPIIT and the PSC. All the interviewed stakeholders also emphasized that the management and overall coordination mechanisms by the HQ PM as well as national PMU have been efficient and effective.

The PMU was found to be well-balanced with respect to gender. With respect to the Indian bicycle industry, the project did not focus on gender dimensions in its interventions, as a minority of female personnel were observed in the stakeholder institutions, owing to the nature of work in the industry, the necessary academic background (namely, mechanical engineering) and cultural factors.

Key recommendations

1. Consideration of a potential follow-up project, based on the needs of the industry, and inclusion of recommendations from the various output reports prepared within the framework of the completed project. The support provided in such a project could focus on:

» Support to manufacturing units, especially MSMEs, through training and awareness-raising activities.

» Incorporation of recommendations of the current project, such as the establishment of a material bank or common facilities for processing of new raw materials such as aluminium.

» Further upgrading of the RDCBSM in additional areas.

2. Dedicated efforts towards demand-related factors, i.e. promotion of cycling, possibly within the framework of a sustainable cities approach, continued awareness-raising activities on the benefits of cycling by the government and comprehensive safety-related standards and requirements to support cycling.

3. The RDCBSM should maintain and expand on the knowledge gained within the framework of the project and implement it through expanded service offerings for the industry. This would include offering short-term training courses based on the knowledge and curriculum gained; providing guidance in areas such as e-bikes; building institutional networks by following-up with partners of joint declarations and other partners met during the various activities; cooperation with local universities; and full utilisation of all equipment procured.

© Shutterstock/Daria Bogomolova

8 INFERENCES AND WAY FORWARD

The project aimed to strengthen the meso-level infrastructure for the bicycle industry, i.e. the RDCBSM, the AICMA and the UCPMA, to further support units in adopting best available technologies and global best practices. The capacity building activities of the project facilitated exposure to advanced new technologies and processes, connected the RDCBSM and the associations with leading counterpart organizations and developed their technical know-how in critical areas.

The project approach allowed for a detailed analysis of the respective competences of and roles played by these organizations, and the subsequent implementation of tailored capacity building programmes. The value of UNIDO's interventions was in the engagement with leading international experts and technical institutions, and the establishment of long-term collaborative relationships that have emerged from these interactions. This extensive resource-network, combined with the acquired skills and expertise, has positioned the target beneficiary organizations to better assist the Indian bicycle industry in building its competitiveness.

As the only technical organization dedicated to the bicycle industry, the RDCBSM has a key role to play in building the competitiveness and innovative capacity of manufacturers, by providing core support services to the industry (such as benchmarking, testing, trouble-shooting), demonstrating new technologies and processes and providing focused process-related guidance to SMEs. Towards this, the UNIDO project has worked on building the RDCBSM's knowledge of some key topics, developing strategic action plans, identifying potential service avenues to be introduced, increasing its interface with industry units, transferring technical resources for future reference and establishing handholding arrangements with appropriate technical partners.

However, in the long run, the internal expertise and research capabilities of the RDCBSM will play a crucial role in the success of the technology transfer and innovation management process in the Indian bicycle industry. Such capabilities serve two purposes: (i) the research capability of the organization allows the firm to better scan the environment for relevant external technology sources, and (ii) the internal research capability of the firm increases its absorptive capacity and improves the integration of external knowledge into the innovation process (Cassiman & Veugelers, 2000).

The utility of a technical centre such as the RDCBSM is in its ability to absorb and relay technological advances to the industry, especially to SMEs. While the RDCBSM remains a focal point for the provision of technical services (such as testing) to the industry, it is not an R&D-based institution in the traditional sense. Therefore, a revival of an applied research function in the organization will be essential to develop in-house expertise and contribute to technology development initiatives. The newly acquired exposure and linkages through the UNIDO project should help facilitate this intrinsic capability. This research function will, no doubt, require recruitment of qualified technical personnel and strategic liaisons with manufacturers, but also appropriate vision and strategy, organizational intelligence, creativity management and appropriate management of technology (Lawson & Samson, 2001).

It is important for the RDCBSM to become at par with (or ideally, ahead of) the industry's knowledge of technologies and new techniques, to maintain its relevance to the bicycle industry's competitiveness. A stronger focus on bicycle production technology, instead of a diversification into supporting other light engineering industries through general services will also be important. A proactive approach towards addressing the bicycle industry's common challenges and providing inputs to policy will build industry confidence in the RDCBSM's relevance and effectiveness. The organisation therefore appears to be at its inflection point, and targeted actions are necessary to ensure its continued operation in a useful and sustainable manner.[14] As the associations are also a part of the RDCBSM's Governing Council, they have an important role to play in providing inputs and guidance to the organization.

The two industry associations—the AICMA and the UCPMA—play an active advocacy, coordination and dissemination-focused role for their respective members. The associations, constituted by all the major players and senior representatives of the industry, are well-versed with the current status and challenges of the industry as well as mechanisms to mobilise resources and policy support for the industry. The project was able to support the associations in establishing contact with leading international industry associations, interact with industry representatives from different parts of the world, observe latest technologies and facilities and undergo training programmes on important topics.

The interventions of the project were designed in line with global best practices and the needs of the Indian bicycle industry. While the meso-level infrastructure has been strengthened to support manufacturers, the industry units require focused handholding and guidance towards becoming globally competitive. This requirement has been substantiated by the industry through a request for a potential second phase of UNIDO support to the bicycle industry, focusing on unit-level interventions. Several critical industry-wide needs were identified during the course of the project, highlighting specific ways in which units could be supported in manufacturing lightweight and high-strength bicycles in newer, superior materials, with advanced design and accessories. The main needs are highlighted below.

Sourcing of and common facilities for newer materials

Most importantly, the issue of sourcing appropriate raw materials (with a focus on aluminium alloy) must be addressed. In an ideal scenario, industry actors must collaborate for the common sourcing of the right grade, thickness and shapes of alloy tubes and blanks, such that a shared 'material bank' would meet the varying quantity requirements of different manufacturers in an economically feasible manner. This initiative could be coordinated by the associations but would also need to be supported by a common processing facility, along with the RDCBSM. Such a facility would comprise an extrusion press, a permanent mould foundry, a heat-treatment facility and equipment for hydroforming.

Training for industry

It is also strongly recommended that advanced technical training is provided to industry units, especially the SMEs, as a combination of hands-on training, on-site production support and guidance in adopting global best practices. In coordination with the strengthened meso-level infrastructure, the organization of technical workshops and deployment of suitable experts on the shop-floor will facilitate increased productivity and modernisation. Some key areas[15] for such training include:

- Development of light-weight aluminium alloy components (such as handles, hubs, frames, forks, disc brakes and rims) including material processing, joining and finishing.
- Development of the main components of e-bikes.
- Adoption of quality management practices and productivity-improvement measures.
- Enhanced aesthetic and industrial design capabilities.

Testing support

Indian bicycle and component manufacturers also need additional testing support to meet international standards and safety requirements. Looking forward, setting up of test facilities for complete e-bikes, plastic and rubber parts and bicycle accessories would be useful for the industry. In addition, the industry would also benefit from the development of tests for quality and benchmarking of top-quality bicycles/components.

Bicycles represent one of the most sustainable modes of transportation, with zero dependence on fossil fuels, no emissions and pollution, health benefits from increased physical activity, and as an affordable means of mobility. Moreover, e-bikes have the added advantage of increased travel efficiency based on faster speed, capacity, and improved connectivity factors, especially in case of shared e-mobility networks. As per estimates by TERI, India can save close to INR 1.8 trillion annually from reduced fuel costs, travel time savings as well as health benefits (from reduced air pollution levels and increased physical activity) if bicycles replace two/four wheelers for short distance trips. Thus, there is immense value in bringing bicycles to the forefront of the mobility landscape.

According to AICMA, approximately 45% of all households in India use a bicycle as a primary mean of transportation. However, cycling penetration in India is not very high, averaging around 90 per 1000 persons as compared to approximately 1100 per 1000 persons in countries like the Netherlands. Thus, there appears to be great potential in increasing bicycle ownership and usage in India, including e-bikes. The global e-bike market alone is expected to grow at 9% CAGR - from USD 21.1 billion in 2018 to USD 38.6 billion by 2025. As the second largest producer of bicycles in the world, the Indian bicycle industry can potentially position itself as a market leader in higher-value bicycles and their specialised components, with a special emphasis on the development and manufacturing of e-bikes, to meet this expected demand. This would require the development of indigenous technical capabilities to produce and export a majority of specialised components, combined with relevant government policies, cycling infrastructure and a sensitization of consumers to facilitate demand.

The repository of knowledge, enhanced skills and institutional linkages established for the RDCBSM, the AICMA and the UCPMA under the UNIDO project can be utilised towards the provision of the requisite support to the industry. Aided by appropriate policy assistance and focused handholding by industry experts, this strengthened institutional support will be instrumental in boosting the Indian bicycle industry's global competitiveness.

[14] Details of the recommendation have been presented in the section titled 'Action Plan'.

[15] A more elaborate list of areas for such training has been highlighted in the section titled 'Report on the Indian Bicycle Industry'.

REFERENCES

Cassiman, B., & Veugelers, R. (2000). *External Technology Sources: Embodied or Disembodied Technology Acquisition*.

Cooke, P. (2008). Regional Innovation Systems, Clean Technology & Jacobian Cluster - Platform Policies. *Regional Science Policy & Practice*, pp. 23–45.

George Papaconstantinou et. al. (1996). *Technology diffusion, productivity and international competitiveness: An empirical analysis (Pg 16)*. European Commission.

Lam, A. (2004, April). Organizational Innovation. *Brunel University, Brunel Research in Enterprise, Innovation, Sustainability, and Ethics*. Uxbridge, West London.

Lawson, B., & Samson, D. (2001). Developing innovation capability in organizations: A dynamic capabilities approach. *International journal of innovation management*, 377–400.

Luecke, R., & Katz, R. (2003). *Managing creativity and innovation*.

Oxer, M. (2000). The Bicycle Industry: Local provider, global partner? Retrieved from ‹http://www.velomondial.net/velomondiall2000/PDF/OXER.PDF›

Persistence Market Research. (2018). *Global Market Study on Bicycles*.

Persistence Market Research. (2019). *Bicycle Market: Growth 2.0 led by robust sales of e-bikes*.

Research and Markets. (2017). Growth Opportunities in the Global Bicycle Industry.

Santos, B., & Hanna, M. (2009). A theoretical review of flexibility, agility and responsiveness in the operations management literature: Toward a conceptual definition of customer responsiveness. *International Journal of Operations and Production Management,* 3–53.

TERI. (2014). *Pedalling towards a greener India: A report on promoting cycling in the country.*

UNIDO. (2019). *Technical report - The Indian bicycle sector.*

ANNEX

Annex I: Request Letter from the State Government of Punjab

From

Director of Industries & Commerce, Punjab,
Chandigarh

To

Sh. M.S. Dhakad,
Programme Director,
United Nations Industrial Development Organization(UNIDO),
International Centre for Advancement of Manufacturing Technology(ICAMT),
CMTI Campus, Tumkur Road,
Banglore -560022

Memo No.Tech/UNIDO/Country Programme/ 13466-67
Dated:- 7-8-12

Subject:- UNIDO Project document on "Technology Upgradation of Bicycle & Bicycle Parts Industry."

Reference your letter no. Nil dated 12.6.2012 on the subject cited above.

In this context, it is informed that the Department of Finance, Govt. of Punjab vide their ID No. 1/31/2009-3FE5/556 dated 11.7.2012 has assured this department that it will release the amount of cash contribution of the State Govt., if the Govt of India(GOI) approves the captioned project.

As such, as requested vide your letter under reference, the Government of Punjab agrees to make a cash contribution of US$ 120,000 (Rs.60.00 lacs approx.) in the captioned project in addition to earlier decision conveyed vide this office no. Tech/15835-36-A, dated 24.8.2011 regarding in-kind contribution of US$ 280,000 in this project through Research & Development Centre for Bicycle at Ludhiana in terms of utilization of building, infrastructure, equipment's, training hall, manpower etc.

It is, therefore, requested to kindly facilitate regarding further approval of the project from the concerned ministry of Govt. of India, at your earliest.

Director of Industries & Commerce, Punjab

Endst. No. Tech/UNIDO/Country Programme/ Dated:-

A copy of the above is forwarded to the following for information and necessary action:-

1. The Secy. to Govt. of India, Ministry of Commerce & Industry, Department of Industrial Policy & Promotion (UNIDO Section), Udyog Bhawan, New Delhi-110011
2. The Principal Secretary, Govt. of Punjab, Department of Finance, Punjab Civil Secretariat, Chandigarh w.r.t. your ID No. 1/31/2009-3FE5/556 dated 11.7.2012.
3. The General Manager, R & D Centre for Bicycle and Sewing Machine, B-38-39, Focal Point, Ludhiana.

Sd/-

Director of Industries & Commerce, Punjab

Annex II: Timeline of Activities

01	02	03	04	05	06	07	08	09	10	11	12
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
								Signing of Project Document by DPIIT			• Release of first tranche of funds • Visit of expert from USA
Project starts					• IPR workshop • Standards workshop • Study tour I to Japan		Diagnostic assessment	Installation of reflector testing facility at RDCBSM	IC-ISID Steering Committee Meeting (IV)	Study tour II to Japan	
Action plan meeting	Visit of Japanese experts to Ludhiana					• Study tour to China • Bicycle design workshop	Extension of project until 31 March 2018		Fellowship training at The Bicycle Academy, U.K.	E-bikes workshop	Study tour to Belgium, Portugal and Germany
• Material behaviour workshop • Hands-on training on bicycle assembly • Fellowship training on e-bikes • Fellowship training on bicycle testing • Extension of project until 31 Aug 2019	FEA workshop			Delivery of equipment pertaining to RoHS/REACH compliance		• Workshop on entrepreneurial competencies • Mission by internal consultant for the Final Evaluation of the project		• Extension of project until 30 November 2019 • Delivery of last testing equipment (Spectrometer)	Installation of testing equipment under Lot 2 (RoHS/REACH compliance testing and Spectrometer)	Installation of testing equipment under Lot 2 (RoHS/ REACH compliance testing)	Installation of 3D printer

2016

2017

2018

2019

Annex III: Twinning Agreements

RDCBSM with CEVT, China

JOINT DECLARATION

by

Research and Development Centre for Bicycles and Sewing Machines (RDCBSM)
B 38-39, Focal Point, Phase V, Ludhiana, Punjab, India -141010
and
National Centre of Supervision and Inspection on Light Electric Vehicles and Battery Products Quality (CEVT)
No. 5, East Chunxin Road, Wuxi City, Jiangsu Province, China - 214101

Regarding intention of collaboration between RDCBSM and CEVT

WHEREAS RDCBSM is a national-level R&D institute established in 1983, dedicated to the field of bicycles, established as an autonomous body under the administrative control of the Government of Punjab, India. The main objective of the centre is to provide technical support to bicycle and bicycle parts manufacturers, to boost the competitiveness of the industry. The activities of the centre include bicycle testing, design and development, provision of common facilities and training. RDCBSM is accredited by the National Accreditation Board for Testing and Calibration Laboratories (NABL) as per ISO/IEC 17025:2005 and is also certified by the Bureau of Indian Standards (BIS);

WHEREAS CEVT is a national-level inspection center established by the State Administration of Quality Supervision, Inspection and Quarantine and specializes in the quality inspection of electric vehicles and battery products. Its testing capabilities cover bicycles electric bicycles, electric motorcycles, electric sightseeing vehicles, four-wheeled all-terrain vehicles, electric scooters, as well as various types of batteries and frames, forks and chargers, motors, controllers, wheels, shock absorbers, etc.

WHEREAS RDCBSM and CEVT having held productive consultations as part of the United Nations Industrial Development Organization (UNIDO) project, titled 'Development and adoption of appropriate technologies for enhancing productivity in the Indian bicycle and bicycle parts sector', wish to record their intentions and objectives for cooperation between RDCBSM and CEVT in the areas of testing and quality control of electrical bicycles and associated components;

RDCBSM and CEVT therefore declare their intention to facilitate cooperation between the two organizations, with the objective of leveraging their collective expertise for testing and quality control for bicycles and bicycle components, subject to the availability of funds and respective programmes of work. This would include, inter-alia:

- Exchange of information pertaining to new developments/trends in the bicycle industry;
- Discussions and information-sharing pertaining to execution of existing and new types of tests and standards for the bicycle industry;
- Exchange of technical material pertaining to standards, procedures and requisite equipment for testing of electric bicycles and associated components;
- Inter-lab comparison of test results to verify proficiency of testing, as applicable and necessary for both organizations;
- Participation in staff exchange programmes and participation in each other's conferences and symposia, as applicable;

General Manager
RESEARCH & DEVELOPMENT CENTRES
For BICYCLE & SEWING MACHINE
(UNDP-UNIDO Assisted Pb. Govt. Project)
B-38-39, FOCAL POINT,
LUDHIANA-141 010 (INDIA)

Both RDCBSM and CEVT agree to review the progress achieved in cooperation between the organizations after a period of two years following the signing of this Joint Declaration and to decide then on any further measures that may be desirable to enhance the cooperation.

Both RDCBSM and CEVT recognize and agree that cooperation is important in contributing to the positive relationship between them and the two institutions are willing to promote further cooperation in the fields mentioned above.

This Declaration is not intended to create any legal or financial obligations on either side under domestic or international law.

Place, Date: Ludhiana 15/9/18

On behalf of the Research and Development Centre for Bicycles and Sewing Machines (RDCBSM)

(Signature)

Name: HARSHARAN SINGH BAINS

Designation: GENERAL MANAGER

On behalf of the National Centre of Supervision and Inspection on Light Electric Vehicles and Battery Products Quality (CEVT)

(Signature)

Name: XIAODONG HUANG

Designation: Deputy President

General Manager
RESEARCH & DEVELOPMENT CENTRES
For BICYCLE & SEWING MACHINE
(UNDP-UNIDO Assisted Pb. Govt. Project)
B-38-39, FOCAL POINT,
LUDHIANA-141 010 (INDIA)

RDCBSM with LEVA, USA

JOINT DECLARATION

by

Research and Development Centre for Bicycle and Sewing Machine (RDCBSM)
B 38-39, Focal Point, Phase V, Ludhiana, Punjab, India -141010
and
Light Electric Vehicle Association (LEVA)
2307 Kent Avenue, Fort Myers, Florida, The United States of America - 33907

Regarding intention of collaboration between RDCBSM and LEVA

WHEREAS RDCBSM is a national-level R&D institute established in 1983, dedicated to provide technical services to the Small and Medium Enterprises (SMEs) in the bicycles, sewing machine and their components, established as an autonomous body under the administrative control of the Government of Punjab, India. The main objective of the centre is to provide technical support to bicycle and bicycle parts manufacturers, to boost the competitiveness of the industry. The activities of the centre include bicycle testing, design and development, provision of common facilities and training. RDCBSM is accredited by the National Accreditation Board for Testing and Calibration Laboratories (NABL) as per ISO/IEC 17025 and is also certified by the Bureau of Indian Standards (BIS);

WHEREAS LEVA represents the strategic interests of light electric vehicle retailers, dealers, distributors, manufacturers and suppliers to promote the development, sale, and use of light electric vehicles worldwide. The purpose of the organization is to provide a service to light electric vehicle companies by helping to establish a favourable operating environment through legislation and regulations, by providing a forum for discussion on non-competitive issues, the promotion of technical standards, and by providing information to assist them in the promotion of their business.

WHEREAS RDCBSM and LEVA having held productive consultations as part of the United Nations Industrial Development Organization (UNIDO) project, titled 'Development and adoption of appropriate technologies for enhancing productivity in the Indian bicycle and bicycle parts sector', intend to promote and strengthen cooperation between RDCBSM and LEVA in the areas of testing and training in the production and use of electrical bicycles and associated components;

RDCBSM and LEVA therefore declare their intention to facilitate cooperation between the two organizations, with the objective of leveraging their collective expertise in the bicycles and electric bicycles sectors, subject to the availability of funds and respective programmes of work. This would include, inter-alia:

- Exchange of information pertaining to new developments/trends in the electric bicycle industry;
- Exchange of technical material pertaining to standards, procedures and requisite equipment for testing of electric bicycles and associated components;
- Participation in staff exchange programmes and participation in each other's conferences and symposia, as applicable;
- Use of LEVA training material for LEVA-certified personnel from RDCBSM to deliver training programmes at in India;

Both RDCBSM and LEVA agree to review the progress achieved in cooperation between the organizations after a period of two years following the signing of this Joint Declaration and to decide then on any further measures that may be desirable to enhance the cooperation.

Both RDCBSM and LEVA recognize and agree that cooperation is important in contributing to the positive relationship between them and the two institutions are willing to promote further cooperation in the fields mentioned above.

This Joint Declaration is not intended to create any legal or financial obligations on either side under domestic or international law.

Place, Date: Ludhiana. RDCBSM 1 March 2019.

On behalf of the Research and Development Centre for Bicycle and Sewing Machine (RDCBSM)

(Signature and stamp)

Name: H.S. Bains

Designation: G.M

Place, Date: March 1, 2019 RDCBSM Ludhiana

On behalf of the Light Electric Vehicle Association (LEVA)

(Signature and stamp)

Name: Don John Gerhardt

Designation: Director - Training

RDCBSM with EFBE Prüftechnik, Germany

JOINT DECLARATION

by
EFBE Pruftechnik GmbH
Landabsatz 25, 45731 Waltrop, Germany
and
Research and Development Centre for Bicycles and Sewing Machines (RDCBSM)
B 38-39, Focal Point, Phase V, Ludhiana, Punjab, India -141010

Regarding intention of cooperation between EFBE and RDCBSM

WHEREAS EFBE, established in 1995, is a leading international test laboratory for mechanical tests on bicycles and components. EFBE provides test services (Safety tests according to international safety standards, quality tests according to EFBE standards and certification with recognised testing seals), test stands to perform testing in accordance with ISO, EN or EFBE standards, as well as a database of test results.

WHEREAS RDCBSM is a national-level R&D institute established in 1983 as an autonomous body under the administrative control of the Government of Punjab, India, to provide technical support to bicycle and bicycle parts manufacturers, to boost the competitiveness of the industry. The activities of the centre include bicycle testing, provision of common facilities and training. RDCBSM is accredited by the National Accreditation Board for Testing and Calibration Laboratories (NABL) as per ISO/IEC 17025:2005 and is also certified by the Bureau of Indian Standards (BIS);

WHEREAS EFBE and RDCBSM, having held productive consultations as part of the United Nations Industrial Development Organization (UNIDO) project, titled 'Development and adoption of appropriate technologies for enhancing productivity in the Indian bicycle and bicycle parts sector', wish to record their intentions and objectives for continued provision of knowledge-support and guidance by EFBE to RDCBSM in the areas of testing of bicycles and associated components;

EFBE and RDCBSM therefore declare their intention to facilitate cooperation between the two organizations, with the objective of leveraging EFBE's expertise towards strengthening RDCBSM's activities in testing and quality control for bicycles and bicycle components, subject to the availability of funds and respective programmes of work. Inter alia, EFBE could support RDCBSM in areas such as:

- Provision of information pertaining to new developments/trends in the global bicycle industry;
- Guidance pertaining to execution of existing and new types of tests and standards for the bicycle industry;
- Sharing of technical material pertaining to standards, procedures and requisite equipment for testing of bicycles and associated components;
- Inter-lab comparison of test results;
- Participation in staff exchange programmes, as applicable;

Both EFBE and RDCBSM agree to review the progress achieved in cooperation between the organizations after a period of two years following the signing of this Joint Declaration and to decide then on any further measures that may be desirable to enhance the cooperation.

Both EFBE and RDCBSM recognize and agree that cooperation is important in contributing to the positive relationship between them and the two institutions are willing to promote further cooperation in the fields mentioned above.

This Declaration is not intended to create any legal or financial obligations on either side under domestic or international law.

On behalf of the Research and Development Centre for Bicycles and Sewing Machines (RDCBSM)

(Signature)

Name: H.S. BAINS
Designation: GENERAL MANAGER
Place, Date: Ludhiana, Punjab India
March 16, 2019

General Manager
RESEARCH & DEVELOPMENT CENTRES
For BICYCLE & SEWING MACHINE
(UNDP-UNIDO Assisted Pb. Govt. Project)
B-38-39, FOCAL POINT,
LUDHIANA-141 010 (INDIA)

EFBE Pruftechnik GmbH

(Signature)

Name: Marcus Schroeder
Designation: Managing Director
Place, Date: 2019-02-27

EFBE
PRÜFTECHNIK
EFBE Prüftechnik GmbH
Landabsatz 25 • 45731 Waltrop

RDCBSM and KBTC, China

JOINT DECLARATION

by

Research and Development Centre for Bicycle and Sewing Machine (RDCBSM)
B 38-39, Focal Point, Phase V, Ludhiana, Punjab, India -141010
and
Kunshan Products Safety Inspection Institute (KBTC), China
1699 Zuchongzhi South Road, Kunshan, Jiangsu, China - 215300

Regarding intention of collaboration between RDCBSM and KBTC

WHEREAS RDCBSM is a national-level R&D institute established in 1983, dedicated to provide technical services to the Small and Medium Enterprises (SMEs) in the bicycles, sewing machine and their components, established as an autonomous body under the administrative control of the Government of Punjab, India. The main objective of the centre is to provide technical support to bicycle and bicycle parts manufacturers, to boost the competitiveness of the industry. The activities of the centre include bicycle testing, design and development, provision of common facilities and training. RDCBSM is accredited by the National Accreditation Board for Testing and Calibration Laboratories (NABL) as per ISO/IEC 17025 and is also certified by the Bureau of Indian Standards (BIS);

WHEREAS KBTC is approved as the national key laboratory by General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China. KBTC is accredited by the China National Accreditation Service for Conformity Assessment (CNAS) and is well-equipped with testing facilities for bicycles and bicycle parts as per various international standards;

WHEREAS RDCBSM and KBTC having held productive consultations as part of the United Nations Industrial Development Organization (UNIDO) project, titled 'Development and adoption of appropriate technologies for enhancing productivity in the Indian bicycle and bicycle parts sector', intend to promote and strengthen cooperation between RDCBSM and KBTC in the areas of testing and quality control of bicycles and bicycle parts;

RDCBSM and KBTC therefore declare their intention to facilitate cooperation between the two organizations, with the objective of leveraging their collective expertise for testing and quality control for bicycles and bicycle components, subject to the availability of funds and respective programmes of work. This would include, inter-alia:

- Exchange of information pertaining to new developments/trends in the bicycle industry;
- Exchange of technical material pertaining to standards and testing of bicycles and bicycle parts;
- Discussions and information-sharing pertaining to execution of existing and new types of tests and standards for the bicycle industry;
- Inter-lab comparison of test results to verify proficiency of testing, as applicable and necessary for both organizations;
- Participation in staff exchange programmes and participation in each other's conferences and symposia, as applicable;

Both RDCBSM and KBTC agree to review the progress achieved in cooperation between the organizations after a period of two years following the signing of this Joint Declaration and to decide then on any further measures that may be desirable to enhance the cooperation.

Both RDCBSM and KBTC recognize and agree that cooperation is important in contributing to the positive relationship between them and the two institutions are willing to promote further cooperation in the fields mentioned above.

This Joint Declaration is not intended to create any legal or financial obligations on either side under domestic or international law.

Place: LUDHIANA, PUNJAB, INDIA
Date: JUNE 10, 2019

Place:kunshan,Jiangsu,China
Date: 2019-5-8

On behalf of the Research and Development Centre for Bicycle and Sewing Machine (RDCBSM)

(Signature)

Name: HARSHARAN SINGH BAINS
Designation: GENERAL MANAGER

On behalf of the Kunshan Products Safety Inspection Institute (KBTC)

(Signature)

Name: Luo haiqing
Designation: Director

RDCBSM and ABIMOTA, Portugal

JOINT DECLARATION

by

All India Cycle Manufacturers' Association (AICMA)
PHD House,4/2, Siri Institutional Area, August Kranti Marg, New Delhi, India - 110016
and
Research and Development Centre for Bicycle and Sewing Machine (RDCBSM)
B 38-39, Focal Point, Phase V, Ludhiana, Punjab, India -141010
and
National Association of Two Wheels Industries, Hardware, Furniture and Related Products (ABIMOTA)
Apartado 299, Borralha, 3754-909, Agueda, Portugal

Regarding intention of collaboration among AICMA, RDCBSM and ABIMOTA

WHEREAS AICMA is the apex national body representing the Indian bicycle industry, whose member companies are mainly large manufacturers accounting for approximately 90% of bicycle production in India. AICMA's objectives include protecting the interests of its member companies, securing and promoting the future of cycling in India, catalysing and coordinating the overall growth and development of the bicycle industry, spearheading innovation, transformation and a global outlook and supporting the development of a bicycle-friendly ecosystem in India;

WHEREAS RDCBSM is a national-level R&D institute established in 1983, established as an autonomous body under the administrative control of the Government of Punjab, India. The main objective of the centre is to provide technical support to bicycle and bicycle parts manufacturers, to boost the competitiveness of the industry. The activities of the centre include bicycle testing, design and development, provision of common facilities and training. RDCBSM is accredited by the National Accreditation Board for Testing and Calibration Laboratories (NABL) as per ISO/IEC 17025 and is also certified by the Bureau of Indian Standards (BIS);

WHEREAS ABIMOTA, established as the National Association of Industrial Bicycles, Mopeds, Motorcycles and Accessories, now known as the National Association of Two Wheels Industries, Hardware, Furniture and Related Products, was founded in 1975, with the objective of being a point of reference at the national level in areas such as standardisation, professional training, sporting events, employment law and testing. ABIMOTA's LEA laboratory is accredited by IPAC (Portuguese Institute of Accreditation) for metrology, material tests, surface tests, product tests (for bicycles and components) and chemical tests;

WHEREAS AICMA and ABIMOTA, having held productive consultations as part of the United Nations Industrial Development Organization (UNIDO) project, titled 'Development and adoption of appropriate technologies for enhancing productivity in the Indian bicycle and bicycle parts sector', intend to promote and strengthen cooperation among AICMA, RDCBSM and ABIMOTA in the areas of testing and quality control for bicycles and bicycle components, as well as regulations and standards for bicycles and bicycle parts;

AICMA, RDCBSM and ABIMOTA therefore declare their intention to facilitate cooperation among the organizations, with the objective of leveraging their collective expertise and outreach for the growth and development of the Indian and European bicycle industries, subject to the availability of funds and respective programmes of work. This would include, inter-alia:

- Exchange of information pertaining to testing, certifications, research, development and demonstration of new developments/trends in the bicycle value chain;
- Discussions and information-sharing pertaining to new standards vis-à-vis tests for the bicycle manufacturing or field tests.
- Inter-lab comparison of test results to verify proficiency of testing, as applicable and necessary for both organizations;
- Participation in staff exchange programmes and participation in each other's conferences and symposia, as applicable.

AICMA, RDCBSM and ABIMOTA agree to review the progress achieved in cooperation between the organizations after a period of two years following the signing of this Joint Declaration and to decide then, on any further measures that may be desirable to enhance the cooperation.

AICMA, RDCBSM and ABIMOTA recognize and agree that cooperation is important in contributing to the positive relationship between the Indian and European bicycle industries and the organizations are willing to promote further cooperation in the fields mentioned above.

This Joint Declaration is not intended to create any legal or financial obligations on either side under domestic or international law.

SIGNATORIES OF JOINT DECLARATION

On behalf of the All India Cycle Manufacturers' Association (AICMA)	**On behalf of the Research and Development Centre for Bicycle and Sewing Machine (RDCBSM)**	**On behalf of the National Association of Two Wheels Industries, Hardware, Furniture and Related Products (ABIMOTA)**
(Signature)	(Signature)	(Signature)
Name: Dr. K. B. THAKUR	Name: HARSHARAN SINGH BAINS	Name:
Designation: SECRETARY GENERAL	Designation: GENERAL MANAGER	Designation:
Place, Date: NEW DELHI 12.04.2019	Place, Date: LUDHIANA PUNJAB INDIA April 10, 2019	Place, Date:

Assinado por : GIL NADAIS RESENDE DA FONS
Num. de Identificação Civil: BI055350275
Data: 2019.05.14 17:40:52 Hora de Verão de GM

CARTÃO DE CIDADÃO

AICMA and UCPMA with CONEBI, Europe

JOINT DECLARATION

by

All India Cycle Manufacturers' Association (AICMA)
PHD House,4/2, Siri Institutional Area, August Kranti Marg, New Delhi, India - 110016
and
United Cycle and Parts Manufacturers Association (UCPMA)
Near Campa Cola Chowk, Gill Road, Ludhiana, Punjab, India – 141003
and
Confederation of the European Bicycle Industry (CONEBI)
Boulevard de la Woluwe 46, b16, 1200 Brussels, Belgium

Regarding intention of collaboration among AICMA, UCPMA and CONEBI

WHEREAS AICMA is the apex national body representing the Indian bicycle industry, whose member companies are mainly large manufacturers accounting for approximately 90% of bicycle production in India. AICMA's objectives include protecting the interests of its member companies, securing and promoting the future of cycling in India, catalysing and coordinating the overall growth and development of the bicycle industry, spearheading innovation, transformation and a global outlook and supporting the development of a bicycle-friendly ecosystem in India;

WHEREAS UCPMA, established in 1967, comprises more than 2300 members mainly in bicycle components industries. UCPMA's key mandate and role is to support its members in safeguarding common interests, sourcing of raw material, give inputs to trade and policy-related discussions and support the overall growth of the Indian bicycle parts/components industry;

WHEREAS CONEBI is an association comprising members from the national bicycle associations in all European countries. CONEBI is the result of the merger of the former COLIPED (the Association of the European Two-Wheeler Parts' and Accessories' Industry) and COLIBI (the Association of the European Bicycle and e-Bike Industry). CONEBI aims to maintain regular contact with European policy makers and other associations that pursue common objectives, the European standardization body CEN, industry experts and the international press. CONEBI's aim is to promote the growth of the bicycle, EPAC and parts and accessories industries, as well as of the cycling culture in Europe;

WHEREAS AICMA, UCPMA and CONEBI having held productive consultations as part of the United Nations Industrial Development Organization (UNIDO) project, titled 'Development and adoption of appropriate technologies for enhancing productivity in the Indian bicycle and bicycle parts sector', intend to promote and strengthen cooperation among AICMA, UCPMA and CONEBI in the areas of promotion of cycling and requisite infrastructure, regulations and standards for bicycles and bicycle parts and adoption of latest manufacturing technologies and processes for bicycle production;

AICMA, UCPMA and CONEBI therefore declare their intention to facilitate cooperation among the organizations, with the objective of leveraging their collective expertise and outreach for the growth and development of the Indian and European bicycle industries, subject to the availability of funds and respective programmes of work. This would include, inter-alia:

- Exchange of information pertaining to new developments/trends in raw materials, components/parts and sub assembly of bicycle manufacturing and best international practices, cleaner technologies and cost reduction solutions;
- Exchange of technical material and publications pertaining to standards, policies and regulations, industry reports and market insights;
- Participation in personnel-exchange programmes and participation in each other's conferences and symposia, as applicable;
- Organization of collaborative consultative meetings and seminars for topics of mutual interest;
- Facilitation of company-to-company collaborations, as applicable.
- Cooperation and complementary action on global common issues of the bicycle value chain and promotion of sustainable transport at various international fora:

AICMA, UCPMA and CONEBI agree to review the progress achieved in cooperation between the organizations after a period of two years following the signing of this Joint Declaration and to decide then, on any further measures that may be desirable to enhance the cooperation.

AICMA, UCPMA and CONEBI recognize and agree that cooperation is important in contributing to the positive relationship between the Indian and European bicycle industries and the organizations are willing to promote further cooperation in the fields mentioned above.

This Joint Declaration is not intended to create any legal or financial obligations on either side under domestic or international law.

SIGNATORIES OF JOINT DECLARATION

On behalf of the All India Cycle Manufacturers' Association (AICMA)	On behalf of the United Cycle and Parts Manufacturers Association (UCPMA)	On behalf of the Confederation of the European Bicycle Industry (CONEBI)
(Signature)	(Signature)	(Signature)
Name: GIRISH KAPUR	Name: INDERJITS. NAVYUG	Name: ERHARD RÜCHEL
Designation: PRESIDENT	Designation: PRESIDENT	Designation: PRESIDENT
Place, Date: N.DELHI, 29.01.19	Place, Date: 30.01.19 (Ludhiana)	Place, Date: BRUSSELS, 25-01

AICMA and ECF, Belgium

JOINT DECLARATION

by

All India Cycle Manufacturers' Association (AICMA)
PHD House,4/2, Siri Institutional Area, August Kranti Marg, New Delhi, India - 110016
and
European Cyclists' Federation (ECF)
Rue Franklin 28, B-1000, Brussels, Belgium

Regarding intention of collaboration between AICMA and ECF

WHEREAS AICMA is the apex national body representing the Indian bicycle industry, whose member companies are mainly large manufacturers accounting for approximately 90% of bicycle production in India. AICMA's objectives include protecting the interests of its member companies, securing and promoting the future of cycling in India, catalysing and coordinating the overall growth and development of the bicycle industry, spearheading innovation, transformation and a global outlook and supporting the development of a bicycle-friendly ecosystem in India;

WHEREAS ECF is an umbrella federation for national cycling organizations (that promote bike for urban mobility) throughout Europe. ECF is pledged to ensure that bicycle-use achieves its fullest potential so as to bring about sustainable mobility and public well-being. To achieve these aims, ECF seeks to change attitudes, policies and budget allocations at the European level. ECF works to facilitate the exchange of information and expertise on bicycle-related transport policies and strategies as well as the work of the cyclists' movement;

WHEREAS AICMA and ECF, having held productive consultations as part of the United Nations Industrial Development Organization (UNIDO) project, titled 'Development and adoption of appropriate technologies for enhancing productivity in the Indian bicycle and bicycle parts sector', intend to promote and strengthen cooperation between AICMA and ECF in the areas of promotion of cycling, cohesive advocacy initiatives for the bicycle industry

AICMA and ECF therefore declare their intention to facilitate cooperation between the two organizations, with the objective of leveraging their collective expertise for the growth and development of the Indian and European bicycle industries and boost cycling-related hard and soft factors, subject to the availability of funds and respective programmes of work. This would include, inter-alia:

- Exchange of information pertaining to new developments/trends in bicycle products and creation of seamless cycling networks, cycle usage technologies, cyclists' safety aspects and recycling; Spreading joint awareness of incredible benefits of cycling in terms of energy, pollution, health, congestion and affordability; Joint persuasions for the promotion of sustainable transport vis-à-vis enabling conditions in various countries through model framework at UN bodies and other international organisations;
- Exchange of technical material and publications pertaining to standards, policies and regulations, industry reports and market insights;
- Participation in personnel-exchange programmes and participation in each other's conferences and symposia, as applicable;

CN

- Organization of collaborative consultative meetings and seminars for topics of mutual interest.
- Cooperation and complementary action on global common issues of the bicycle value chain at various international forums;

Both AICMA and ECF agree to review the progress achieved in cooperation between the organizations after a period of two years following the signing of this Joint Declaration and to decide then on any further measures that may be desirable to enhance the cooperation.

Both AICMA and ECF recognize and agree that cooperation is important in contributing to the positive relationship between them and the two institutions are willing to promote further cooperation in the fields mentioned above.

This Joint Declaration is not intended to create any legal or financial obligations on either side under domestic or international law.

Place, Date:
Brussels, 14th of May 2019

SIGNATORIES OF JOINT DECLARATION

On behalf of the All India Cycle Manufacturers' Association (AICMA)

(Signature)

Name: GIRISH KAPUR
Designation: PRESIDENT, AICMA
Place, Date: NEW DELHI, 12th JUNE, 2019

On behalf of the European Cyclists' Federation (ECF)

(Signature)

Name: NAJDOVSKI
Designation: President of ECF
Place, Date:
Brussels, 14th of May 20.

Annex IV: Request from the Industry for Testing Facility as per REACH Directive

ALL INDIA CYCLE MANUFACTURERS' ASSOCIATION

PHD House, 3rd Floor, 4/2 Siri Institutional Area, August Kranti Marg, New Delhi – 110016
Phone 011-41040833; *Email:* sgaicma@gmail.com; *Website.* www.aicma.org

No. AICMA / 10.1 / 2017
Dated: 5th July, 2017

The General Manager
Bicycle R&D Centre
Ludhiana

Sub: SETTING UP OF REACH FACILITY AT BICYCLE R&D CENTRE, LUDHIANA-REG.

Dear Sir,

The AICMA has been increasingly receiving request from its members companies (e.g. TI Cycles–copy enclosed) as well from their vendors (e.g. Ralson Tyres - copy enclosed) with a prequest to set up of REACH FACILITY in the bicycle R&D Centre, Ludhiana. This facility is needed to meet European Standards requirement for exports of Indian bicycles and components in the European markets. In absence of this Facility in India, the Indian exporters are dependent on the EU Labs –which have exorbitant tests charges as also have long lead time. This bottleneck is becoming a potential constraint in the export of Indian bicycle / components to European market and likely to become more critical in view of additional investment being made by Indian companies in exports.

Accordingly, it is requested to include / accommodate REACH Testing Facility in the on-going UNIDO project on priority against less important facility within the same project cost.

Thanking you,

Yours faithfully,

(Dr. K. B. Thakur)
Secretary General

Enclosure: As above

"Our motto: All for Cycling, Cycles for all"

Annex V: Press Coverage

Coverage of visit of international expert during the diagnostic assessment

cityair News

FICO interacted with UNIDO team for Exports Bicycles & Parts to USA

City Air NewsAuthor(s):

Ludhiana, August 18, 2017: Today, a team of United Nations Industrial Development Organization (UNIDO) of Prof Mr. Jim Papadopoulos, PhD, Boston USA & Ms.Shraddha Srikant Project Assistant UNIDO International Centre for Inclusive and Sustainable Industrial Development (IC-ISID) met Mr.Gurmeet Singh Kular President along with S.Manjinder Singh Sachdeva General Secretary FICO regarding Exports of Bicycle & Bicycle Parts to United States of America (USA).

As India is the second largest manufacturer of Bicycle & Bicycle Parts in the world, after China, but being second largest manufacturer India's export to the United States in Negligible.

There is a trend of Hi-End Bicycles in USA market. So, in order to export our products, we have to focus on hi-end bicycles & bicycle parts, Like Carbon Alloy Bicycle Parts.

Mr. Jim Papadopoulos discussed the bottlenecks of the export to the United States of America, and suggested there should be a cluster of hi-end parts exporters, and India should export their products to USA as USA is a big Market of Bicycle Industry.
In September a 40 Members delegation of FICO is going to USA to attend Interbike to be held from 20 to 22 September 2017 & Explore opportunities in USA especially for Bicycle industry.

Date:
Friday, August 18, 2017

Cityair News, Aug 18 2017

Visit of international expert during the diagnostic assessment

cityair News

BRADO interacted with UNIDO Team regarding upgradation of Research & Development Center for Bicycle Industry

City Air NewsAuthor(s):

Ludhiana, September 2, 2017: Today Team of United Nations Industrial Development Organization (UNIDO) Comprising Mr. Jan Haraldsen (Associated Partner), Impello Management USA & Ms. Shraddha Srikant (Project Assistant) International Centre for Inclusive & Sustainable Industrial Development (UNIDO-IC-ISID) met S.Onkar Singh Pahwa Chairman Bicycle Research & Development Organization (BRADO) along with S.Manjinder Singh Sachdeva President & Gurmeet Singh Kular General Secretary regarding the upgradation of Research & Development Centers to meet future prospective of Bicycle Industry.
As India is the second largest manufacturer of Bicycle & Bicycle Parts in the world, after China, but in India we are into the manufacturing of Roadster Bicycle commonly known as Black Cycle, whose future prospective are almost zero. Future of Bicycle Industry are Hi-End Bicycles which will be using Aluminum Alloy Frame, Aluminum Alloy Forks, Aluminum Alloy Rims, BB Cassettes, derailleur, etc. these parts are not being manufactured in our country, neither we have research & development centers capable enough to research & implement on the said modern technology. So, in order to keep ourselves up-to-date we have to adapt the modern technology and start working on high-end bicycle and high end bicycle parts of Aluminum Alloy, Carbon Steel Etc.
In September a 40 Members delegation of FICO is going to USA to attend Interbike to be held from 20 to 22 September 2017 & Explore opportunities in USA especially for Bicycle industry.
BRADO will Research & Develop high end Products to meet the International demand.
Amongst Present were Mr. Jan Haraldsen (Associated Partner) Impello Management USA, Ms. Shraddha Srikant (Project Assistant) UNIDO-IC-ISID, S. Onkar Singh Pahwa Chairman BRADO, Sh. B.S. Dhiman President Avon Cycle Limited, S. Manjinder Singh Sachdeva President & Gurmeet Singh Kular General Secretary BRADO.

Date:
Saturday, September 2, 2017

Cityair News, Sep 2 2017

Coverage of meeting with UCPMA during diagnostic assessment

www.ucpma.net

United Cycle & Parts Manufacturers Association

ਯੂ.ਸੀ.ਪੀ.ਐਮ.ਏ. ਵਿਖੇ ਯੂਨੀਡੋ ਦੇ ਵਫ਼ਦ ਦੇ ਆਗੂ ਜਿਮ ਪਾਪਾਡੋਪੂਲੋਸ, ਸ਼ਰਧਾ ਸ਼੍ਰੀਕਾਂਤ ਨਾਲ ਮੀਟਿੰਗ ਕਰਨ ਸਮੇਂ ਜਨਰਲ ਸਕੱਤਰ ਰਾਜੀਵ ਸੈਨ, ਗੁਰਚਰਨ ਸਿਘ ਮਠਾਰੂ, ਅਵਤਾਰ ਸਿਘ ਭੋਗਲ, ਸੁਰਿਦਰ ਸਿਘ ਮੈਪਕੋ, ਮਨਮੋਹਣ ਸਿਘ ਮਾਰਟਨ। ਤਸਵੀਰ : ਨੀਲ ਕਮਲ

ਯੂ.ਸੀ.ਪੀ.ਐਮ.ਏ. ਦੇ ਵਫ਼ਦ ਨਾਲ ਯੂਨੀਡੋ ਦੇ ਵਫ਼ਦ ਦੀ ਅਹਿਮ ਮੀਟਿੰਗ

ਲੁਧਿਆਣਾ, 21 ਅਗਸਤ (ਪ੍ਰਨੀਤ ਸ਼ਰਮਾ)-ਯੂਨਾਈਟਿਡ ਸਾਈਕਲ ਐਂਡ ਪਾਰਟਸ ਮੈਨੂੰਫੈਕਚਰਜ਼ ਐਸੋਸੀਏਸ਼ਨ (ਯੂ. ਸੀ. ਪੀ. ਐਮ. ਏ.) ਵਿਖੇ ਸਾਈਕਲ ਨਿਰਮਾਤਾਵਾਂ ਦੀਆਂ ਜ਼ਰੂਰਤਾਂ ਤੇ ਸਮੱਸਿਆਵਾਂ ਬਾਰੇ ਵਿਚਾਰ ਵਟਾਂਦਰਾ ਕਰਨ ਲਈ ਇਕ ਅਹਿਮ ਮੀਟਿੰਗ ਹੋਈ, ਜਿਸ ਵਿਚ ਯੂਨੀਡੋ (ਯੂਨਾਈਟਿਡ ਨੇਸ਼ਨਸ ਇੰਡਸਟਰੀਅਲ ਡਿਵੈਲਪਮੈਂਟ ਆਰਗੇਨਾਈਜੇਸ਼ਨ) ਦੇ ਪ੍ਰਾਜੈਕਟ ਮੈਨੇਜਰ ਜਿਮ ਪਾਪਾਡੋਪੂਲੋਸ ਅਤੇ ਸ਼ਰਧਾ ਸ਼੍ਰੀਕਾਂਤ ਵਿਸ਼ੇਸ਼ ਤੌਰ 'ਤੇ ਪੁੱਜੇ। ਸ੍ਰੀ ਜਿਮ ਨੇ ਦੱਸਿਆ ਕਿ ਯੂਨੀਡੋ ਸਨਅਤਕਾਰਾਂ ਦੀ ਹਰ ਸਹਾਇਤਾ ਕਰਨ ਦੇ ਲਈ ਤਿਆਰ ਹੈ, ਪਰ ਇਸ ਲਈ ਸਾਰੇ ਸਨਅਤਕਾਰਾਂ ਇਕ ਮੰਚ 'ਤੇ ਇਕੱਠੇ ਹੋ ਕੇ ਐਸ. ਪੀ. ਵੀ ਬਣਾਉਣ ਅਤੇ ਆਪਣੇ ਵੈਲਫੇਅਰ, ਸੋਸ਼ਿਡ ਵਰਕਸ ਸਾਫਟਵੇਅਰ, ਪੀ. ਐਂਡ. ਸੀ. ਮਸ਼ੀਨ ਦੀ ਸਿਖਲਾਈ, ਪੇਟੈਂਟ ਤੇ ਕੋਲਡ ਵਿਦੇਸ਼ੀ ਤਕਨਾਲੋਜੀ ਬਾਰੇ ਸਿਖਲਾਈ ਦੇਣ ਲਈ ਮਾਹਿਰਾਂ ਦੀ ਨਿਯੁਕਤੀ ਕਰਨ ਨੂੰ ਯਕੀਨੀ ਬਣਾਉਣ। ਉਨ੍ਹਾਂ ਕੰਢਾ ਮਾਲ ਸਟੋਰ ਕਰਨ ਲਈ ਕੰਢਾ ਮਾਲ ਬੈਂਕ ਅਤੇ ਸਨਅਤਕਾਰਾਂ ਦੀ ਭਲਾਈ ਲਈ ਸਾਝਾ ਮੰਚ ਤਿਆਰ ਕਰਨ 'ਤੇ ਵੀ ਜ਼ੋਰ ਦਿੱਤਾ। ਯੂਨੀਡੋ ਦੇ ਵਫ਼ਦ ਨੂੰ ਯੂ. ਸੀ. ਪੀ. ਐਮ. ਏ. ਦੇ ਜਨਰਲ ਸਕੱਤਰ ਰਾਜੀਵ ਸੈਨ ਅਤੇ ਸ੍ਰੀ ਨਾਨਕ ਸਨਅਤਕਾਰ ਅਵਤਾਰ ਸਿਘ ਭੋਗਲ ਨੇ ਕਿਹਾ ਕਿ ਸਾਈਕਲ ਦੇ ਹਾਈਐਂਡ ਕਲਪੁਰਜ਼ੇ ਬਣਾਉਣ ਦਾ ਪਲਾਂਟ ਭਾਰਤ ਦੇ ਸਨਅਤਕਾਰਾਂ ਦੇ ਨਾਲ ਸਾਝੇਦਾਰੀ ਵਿਚ ਲੱਗਣ ਨਾਲ ਭਾਰਤੀ ਸਾਈਕਲ ਸਨਅਤ ਨੂੰ ਕਾਫ਼ੀ ਲਾਭ ਮਿਲ ਸਕਦਾ ਹੈ।

ਯੂਨੀਡੋ ਸਨਅਤਕਾਰਾਂ ਦੀ ਹਰ ਪੱਖੋਂ ਸਹਾਇਤਾ ਕਰਨ ਦੇ ਲਈ ਤਿਆਰ-ਜਿਮ

ਉਨ੍ਹਾਂ ਮੰਗ ਕੀਤੀ ਕਿ ਸਾਈਕਲਾਂ ਦੀ ਜਾਚ ਤੇ ਖੋਜ ਕਰਨ ਵਾਲਾ ਲੁਧਿਆਣਾ ਵਿਖੇ ਖੋਜ ਤੇ ਵਿਕਾਸ ਕੇਂਦਰ ਬਣਾਇਆ ਗਿਆ ਹੈ, ਉਸ ਨੂੰ ਸਮੇਂ ਦਾ ਹਾਣੀ ਬਣਾ ਕੇ ਉਸ ਤੋਂ ਪਾਸ ਹੋਏ ਉਤਪਾਦਾਂ ਨੂੰ ਯੂਰੋਪ ਤੇ ਯੂ.ਐਸ.ਏ. ਵਿਚ ਨਿਰਯਾਤ ਕਰਨ ਦੀ ਇਜਾਜ਼ਤ ਮਿਲਣੀ ਚਾਹੀਦੀ ਹੈ। ਇਸ ਮੌਕੇ ਗੁਰਚਰਨ ਸਿਘ ਮਠਾਰੂ, ਸੁਰਿਦਰ ਸਿਘ ਮੈਪਕੋ, ਰਾਜਿਦਰ ਸਿਘ ਸਹਰਾਲੀ, ਮਨਮੋਹਣ ਸਿਘ ਮਾਰਟਨ ਆਦਿ ਹਾਜ਼ਰ ਸਨ।

Punjab Kesari (Local regional newspaper), 21 Aug 2017

Coverage of IPR workshop

VIKASH KUMAR, DEPUTY DIRECTOR, UNIDO

'Awareness, adoption of intellectual property rights need of the hour'

LUDHIANA: There is a lack of awareness and adoption of the intellectual property rights (IPRs) and patent rights in our country which could have wider ramifications, including legal repercussions and infringing of product design can also cause loss of revenue to the respective firm, said Vikash Kumar, deputy director, United Nations Industrial Development Organisation (UNIDO).

In an interview with HT Correspondent Summer Singh, Kumar on the sidelines of a two-day workshop on IPR and patents for the bicycle industry in Ludhiana, opened up about the relevance of IPRs and patents in competitive business scenario. He also dwelt upon ongoing and future projects of UNIDO in the country and oversea.

What significance does IPR and patent rights hold in the current business scenario?

Today, business enterprises in their bid to enhance their competitiveness, come up with a number of innovative products on daily basis.

Vikash Kumar

turing components that are being imported from abroad. That is where UNIDO comes into picture, to tap into the growing share of cycle market in premium and high-end cycles, we have technology transfer programmes in the pipeline that will be rolled out soon.

Apart from the cycle industry, what all industrial projects UNIDO has taken up in India and what is their current status?

We have a large scale of projects going on in cement, paper and leather industries in the country. In the cement industry we are working on to provide alternative fuel and raw material items used for manufacturing of cement central to every UNIDO project. The latest techniques that I talked about (above) are all aimed at optimum utilisation of natural resources with minimum impact on the environment. For example, we use solar power for the processing of leather and it is done in such a way that the quality of effluent is improved upon with latest treatment techniques. With the introduction of such new techniques, we had been able to reduce the waste material generated after production.

Any international project that UNIDO is currently working on?

We in collaboration with the Centre under South Co-operation programme (one developing nation assist other developing nation) assisting African countries such as Nigeria, Ghana and Sierra Leone to develop pesticide from neem tree (Nimtree). Our experts have been imparting the training to farmers and agricultural scientists in these countries to adapt to the change. This pesticide generated from a natu-

Hindustan Times, 03 June 2017

Coverage of IPR workshop

Two-day workshop on intellectual property rights

HT Correspondent
ludhiana@hindustantimes.com

DEVELOPMENT BODY IN COLLABORATION WITH TIFAC WILL ORGANISE THE WORKSHOP ON FRIDAY

LUDHIANA: United Nation Industrial Development Organisation (UNIDO) will organise a two-day workshop on intellectual property rights (IPR) and patents on Friday.

UNIDO in collaboration with Technology Information, Forecasting and Assessment Council (TIFAC), a unit of the department of science and technology, will hold the workshop.

To stay afloat in a cut-throat competition in the business world, it is important that business enterprises keep themselves abreast with latest intellectual property rights (IPR) practices to safeguard their product and service innovation, said experts at the Research and Design for Cycle industry in Ludhiana.

Talking to HT, general manager of R and D centre for bicycle said, "The train the trainee programme is aimed at providing the latest information on patents and IPRs to the scientists and engineers of RDCBSM. The seminar will dwell upon nuances and applicability of patents and IPRs in the bicycle sector. The workshop will also see participation from representatives of the All India Cycle Manufacturers Association (AICMA) and the United Cycles and Parts Manufacturers Association (UCPMA)."

Sessions on patenting system in India, copyright issues for scientists, role of industrial design in the bicycle industry, novelty and inventiveness in patents, managing IP in industry and protecting IP abroad will also be included in the workshop.

A cycle manufacturer, requesting anonymity, said, "Bitter legal row over IPRs for a product design between two cycle making giants Hero Cycles and Avon Cycles the last year where former dragged the latter in a local court for allegedly copying its cycle design, has caught every cycle manufacturer's fancy."

He added that since then there have been several requests from cycle makers for organising seminars or workshops on national and global IPR practices.

Hindustan Times e-paper, 03 June 2017

Coverage of IPR workshop

विदेशों के मुकाबले भारतीय बाइसाइकिल इंडस्ट्री डिजाइन पेटैंट करवाने में 10 गुना पीछे

यूनिटों के अधिकारियों ने कारोबारियों को बताए आई.पी.आर. के फायदे

लुधियाना, 2 जून (बहल): विश्व बाजार में हाई एंड बाइसाइकिल के प्रति तेजी से बढ़ रहे रुझान के मद्देनजर भारत के युवाओं का भी फैंसी बाइसाइकिल के लिए बढ़ रहा क्रेज साइकिल इंडस्ट्री में बड़े बदलाव की दस्तक दे रहा है। भारतीय साइकिल निर्माता भी वैश्विक चुनौतियों का मुकाबला करने के लिए अपने ब्रांड को प्रोमोट करने में जुटे हैं, लेकिन अपने प्रोडक्ट डिजाइन को पेटैंट करवाने में विदेशों के मुकाबले आज भी 10 गुना पिछड़े हुए हैं। परिणामस्वरूप साइकिल इंडस्ट्री के बड़े दिग्गजों को भी कई बार इसी कारण से आपसी टकराव में अदालतों की शरण में जाना पड़ जाता है।

इसी संदर्भ में यूनाइटेड नैशन इंडस्ट्रीयल डिवैल्पमैंट ऑर्गेनाइजेशन द्वारा टैक्नोलॉजी इन्फॉर्मेशन फॉर कास्ट्रिया एंड असैस्मैंट काऊंसिल (टिफैक) के सहयोग से फोकल प्वाइंट स्थित आर. एंड डी. बाइसाइकिल सैंटर में इंटैलैक्चुअल प्रॉपर्टी राइट्स (आई.पी.आर.) और डिजाइन पेटैंट पर आधारित 2 दिवसीय वर्कशॉप का आज से आयोजन प्रारम्भ किया गया है।

वर्कशाप के दौरान अतिथि व अन्य।

कार्यक्रम में बतौर मुख्य वक्ता शामिल हुए हीरो साइकिल के एम.डी. एस.के. राय ने कहा कि इंडस्ट्री को अपना लाभांश बढ़ाने और विकास के नए आयाम छूने के लिए दिल खोलकर अपने उत्पादों को पेटैंट करवाना चाहिए। एस.के. राय ने साइकिल कारोबारियों को आई.पी.आर. की विभिन्न किस्मों के बारे में विस्तार से जानकारी भी दी।

सैमीनार में यूनिडो के हिप्टी डायरैक्टर विकास कुमार, प्रोजैक्ट सहायक श्रद्धा श्रीकांत, पी.एफ.सी. और टिफैक के प्रमुख यशवंत पंवार, सहायक पेटैंट कंट्रोलर सुखदीप सिंह और सी.आई.आई. के वरिष्ठ एडवाइजर आर. साहा ने भारत में बाइसाइकिल डिजाइन को पेटैंट करवाने के फायदों और आई.पी.आर. के जरिए कानूनी सुरक्षा प्रावधानों पर विस्तार से प्रकाश डाला।

डिजाइन पेटैंट करवाने से निर्यातक होंगे सेफ : बाइसाइकिल आर एंड डी. सैंटर के जी.एम. चालिया ने कहा कि विदेशों में बाइसाइकिल एवं कलपुर्जे निर्यात करने वाले एक्सपोर्टरों को कानूनी पेचीदगियों से बचने के लिए अपने प्रोडक्ट को पेटैंट करवाना बेहद लाजिमी है। कई बार इस संबंधी जानकारी के अभाव में मिलते-जुलते डिजाइन के कलपुर्जों के निर्यात पर अंतर्राष्ट्रीय नियमों के तहत कानूनी प्रक्रिया का सामना करना पड़ता है।

ट्रेनरों को प्रशिक्षित करना जरूरी

सिर्फ सैंटर के एजीक्यूटिव मैम्बर एवं प्रमुख साइकिल उद्योगपति अवतार भोगल ने कहा कि साइकिल इंडस्ट्री की ग्रोथ के लिए यूनिडो द्वारा ट्रेनरों को भी प्रशिक्षित करने के लिए आयोजित यह कार्यक्रम बेहद महत्वपूर्ण है। ऐसे सैमीनारों के रैगुलर आयोजन से इंडस्ट्री को नए डिजाइन और नियमों के प्रति जागरूक किया जाना चाहिए।

ਪੰਜਾਬ ਕੇਸਰੀ ई-ਪੇਪਰ Sat, 03 June 2017
epaper.punjabkesari.in//c/19520093

Punjab Kesari e-paper, 03 June 2017

Coverage of visit Japanese experts to Ludhiana

UNIDO delegation visits Ludhiana, holds meet with industrialists to upgrade bicycle sector

By **The Hush Post** - February 16, 2018

Director Industries Punjab claims govt is always ready to help the industry

The Hush Post, Ludhiana: Aiming to strengthen the bicycle industry in Ludhiana, a delegation of United Nations Industrial Development Organization (UNIDO) comprising two experts from Japan, along with officials of Industries department, Punjab visited plants of Hero Cycles and Avon Cycles in Ludhiana on Friday.

UNIDO delegation visits Ludhiana, holds meet with industrialists to upgrade bicycle sector

UNIDO delegation members in Ludhiana on Friday.

The delegation includes UNIDO Project Manager (Bicycle Project) Anders Isakkson, Project Assistant Sharaddha Srikant, experts Takashi Nagahori, Kazunobu Tokuda held a meeting with Director Industries, Punjab DPS Kharbanda, Additional Director Industries SM Goel, Hero Cycles' representatives including Abhishek Munjal, SK Rai and other Bicycle manufacturers.

They discussed various aspects including the adoption of appropriate technology advancement in the bicycle sector in Punjab and increasing its competitiveness in the global market. They also talked how the technology from Japan can provide the assistance to local Industrialists to compete with Chinese counterparts. They also had also detailed deliberations on the general problems of productivity and quality.

The main object of the visit was to strengthen the technical capabilities of the sector and to get the information about the needs of the bicycle industry.

Director Industries, Punjab DPS Kharbanda said that in order to keep our industry upgraded, it is need of the hour to adopt the modern technology and start working on the manufacturing the high-end bicycles, cycle parts of Aluminum Alloy, Carbon Fibre and other. He said Punjab Government is ready to provide any kind of help to the industry.

The delegation members, DPS Kharbanda, SM Goel, General Manager of Research and Development (R&D) center for Bicycles, HS Bains, Managers YA Khan, TP Singh, Tajinder Singh, General Manager District Industries Centre Amarjeet Singh and others also visited manufacturing plant. Later, they also visited Avon Cycles and its manufacturing unit.

The Hush Post, 16 Feb. 2018

Coverage of visit Japanese experts to Ludhiana

ਲੁਧਿਆਣਾ ਦੀ ਸਾਈਕਲ ਇੰਡਸਟਰੀ ਨੂੰ ਅੱਪਗ੍ਰੇਡ ਕਰਨ ਹਿੱਤ ਯੂਨੀਡੋ ਦਾ ਵਫਦ ਪੁੱਜਾ ਮਹਾਨਗਰ

➤ਹੀਰੋ ਅਤੇ ਏਵਨ ਸਾਈਕਲ ਦਾ ਦੌਰਾ ਕਰ ਕੇ ਜਾਪਾਨੀ ਤਕਨੀਕ 'ਤੇ ਕੀਤੀ ਚਰਚਾ ➤ਇੰਡਸਟਰੀ ਦੀ ਹਰ ਸੰਭਵ ਮਦਦ ਕਰਨ ਲਈ ਤਿਆਰ ਰਾਜ ਸਰਕਾਰ : ਖਰਬੰਦਾ

ਪੰਜਾਬ ਦੀ ਸਾਈਕਲ ਇੰਡਸਟਰੀ ਨੂੰ ਅੱਪਗ੍ਰੇਡ ਕਰਨ ਸਬੰਧੀ ਮੀਟਿੰਗ ਦੌਰਾਨ ਯੂਨੀਡੋ ਦਾ ਵਫਦ, ਡਾਇਰੈਕਟਰ ਖਰਬੰਦਾ ਤੇ ਉਦਯੋਗਪਤੀ।

ਮੀਟਿੰਗ ਦੌਰਾਨ ਜਾਪਾਨੀ ਮਾਹਿਰ ਜਿਸਤਰ ਵਫਦ ਕਰਦੇ ਹੋਏ।

ਲੁਧਿਆਣਾ, 16 ਫਰਵਰੀ (ਬਹਿਲ)- ਪੰਜਾਬ ਦੇ ਉਦਯੋਗਿਕ ਮਹਾਨਗਰ ਲੁਧਿਆਣਾ ਦੀ ਸਾਈਕਲ ਇੰਡਸਟਰੀ ਦੀ ਤਰੱਕੀ ਲਈ ਯੂਨਾਈਟਿਡ ਨੈਸ਼ਨਲ ਇੰਡਸਟਰੀਅਲ ਡਿਵੈਲਪਮੈਂਟ ਆਰਗੇਨਾਈਜੇਸ਼ਨ (ਯੂਨੀਡੋ) ਦੇ ਇਕ ਵਫਦ ਨੇ ਅੱਜ ਹੀਰੋ ਸਾਈਕਲ ਅਤੇ ਏਵਨ ਸਾਈਕਲ ਦਾ ਦੌਰਾ ਕੀਤਾ।

ਇਸ ਵਫਦ ਵਿਚ ਯੂਨੀਡੋ ਦੇ ਪ੍ਰੋਜੈਕਟ ਮੈਨੇਜਰ ਏਂਡਰਸ ਇਸਕਸਨ, ਪ੍ਰੋਜੈਕਟ ਅਸਿਸਟੈਂਟ ਸ਼ਰਧਾ ਸ੍ਰੀਕਾਂਤ, ਜਾਪਾਨ ਤੋਂ ਮਾਹਿਰ ਤਕਨੀਕੀ ਨਾਗਾਹੋਰੀ ਅਤੇ ਕਜੂਨੋਬ ਟੁਕੂਡਾ, ਡਾਇਰੈਕਟਰ ਇੰਡਸਟਰੀਜ਼ ਪੰਜਾਬ ਡੀ. ਪੀ. ਐੱਸ. ਖਰਬੰਦਾ, ਵਧੀਕ ਡਾਇਰੈਕਟਰ ਐਸ. ਐਮ. ਗੋਇਲ, ਆਰ. ਐਂਡ ਡੀ. ਸੈਂਟਰਦੇ ਸੀ. ਐਮ. ਐੱਚ. ਐੱਸ. ਬੈਂਸ, ਮੈਨੇਜਰ, ਵਾਈ. ਏ. ਖਾਨ, ਟੀ. ਪੀ. ਸਿੰਘ, ਤਜਿੰਦਰ ਸਿੰਘ ਅਤੇ ਜ਼ਿਲਾ ਉਦਯੋਗ ਕੇਂਦਰ ਦੇ ਜੀ. ਐੱਮ. ਅਮਰਜੀਤ ਸਿੰਘ ਆਦਿ ਹਾਜ਼ਰ ਸਨ।

ਮੀਟਿੰਗ 'ਚ ਡਾਇਰੈਕਟਰ ਇੰਡਸਟਰੀ ਹਾਲੀ ਐਂਡ ਟੈਕਨਾਲੋਜੀ ਨਾਲ ਵਫਦ ਨੇ ਸਾਈਕਲ ਪ੍ਰਤੀ ਲੋਕਾਂ ਦਾ ਰੁਝਾਨ ਤੱਕੀ ਨਾਲ ਵਧ ਰਿਹਾ ਹੈ ਅਤੇ ਭਾਰਤੀ ਇੰਡਸਟਰੀ ਨੂੰ ਵੀ ਨਵੀਂ ਟੈਕਨਾਲੋਜੀ ਅਪਣਾ ਕੇ ਸਾਈਕਲ ਅਤੇ ਕਲਪੁਰਜ਼ਿਆਂ ਦਾ ਨਿਰਮਾਣ ਕਰਨ ਦੀ ਲੋੜ ਹੈ ਤਾਂ ਕਿ ਵਿਸ਼ਵ ਮਾਰਕੀਟ 'ਚ ਭਾਰਤੀ ਇੰਡਸਟਰੀ ਦਾ ਮੋਰਚਾਨ ਬਧ ਸਕੇ। ਮੀਟਿੰਗ ਦੌਰਾਨ ਯੂਨੀਡੋ ਦੇ ਵਫਦ, ਅਧਿਕਾਰੀਆਂ ਅਤੇ ਉਦਯੋਗਪਤੀਆਂ ਨੇ ਸਾਈਕਲ ਇੰਡਸਟਰੀ ਨੂੰ ਹਾਲੀ ਐਂਡ ਕਾਰਬਨ ਟੈਕਨੋਲੋਜੀ 'ਤੇ ਵਿਸਥਾਰ ਨਾਲ ਚਰਚਾ ਕੀਤੀ। ਵਫਦ ਨੇ ਲੁਧਿਆਣਾ ਦੀ ਸਾਈਕਲ ਇੰਡਸਟਰੀ ਨੂੰ ਚੀਨੀ ਸਾਈਕਲ ਉਦਯੋਗ ਦਾ ਮੁਕਾਬਲਾ ਕਰਨ ਲਈ ਜਾਪਾਨੀ ਤਕਨੀਕ ਮੁਹੈਇਆ ਕਰਵਾਉਣ ਸਬੰਧੀ ਵਿਚਾਰ ਵਟਾਂਦਰਾ ਕੀਤਾ। ਵਫਦ ਨੇ ਹੀਰੋ ਅਤੇ ਏਵਨ ਸਾਈਕਲ ਦੀਆਂ ਫੈਕਟਰੀਆਂ 'ਚ ਸਾਈਕਲ ਅਤੇ ਕਲਪੁਰਜ਼ਿਆਂ ਦੇ ਨਿਰਮਾਣ ਦੀ ਤਕਨੀਕ ਅਤੇ ਕਾਰਜਸ਼ੈਲੀ ਦਾ ਵੀ ਅਵਲੋਕਨ ਕੀਤਾ।

Punjab Kesari e-paper, 16 Feb 2018

Coverage of visit Japanese experts to Ludhiana

UN delegation along with officials of state industries department at Hero Cycles plant. HT PHO

UN delegation to help bicycle industry with R&D, technology

HT Correspondent
• lalhan@hindustantimes.com

LUDHIANA: Aiming to strengthen the city's bicycle industry, a delegation of the United Nations Industrial Development Organisation (UNIDO) has assured that it will provide technology and assistance in research and development , here, on Friday.

The UNIDO team headed by bicycle project manager Anders Isakkson and comprising two experts from Japan, along with other officials of the state industries department, visited the Hero Cycles and Avon Cycles plant.

They reviewed the existing technology in the companies' bicycle and sewing machine plants.

The delegation included, UNIDO project assistant Sharaddha Srikant, and experts such as Takashi Nagahori, Kazunobu Tokoda.

The delegation also met Punjab industries and commerce director DPS Kharbanda and Hero Cycles' representatives, Abhishek Munjal, SK Rai, and other bicycle manufacturers.

Kharbanda said the meeting aimed to involve experts from Japan and other countries to assist in enhancing the research and development centre in the city.

"Japanese Management Association has agreed to provide crash course to the centre's staff," Kharbanda added.

Shraddha Srikant had confirmed that the state government had asked them for assistance and informed that h team will study the ground sit ation till Monday.

PART OF ₹18 CRORE GRANT RELEASED

Kharbanda also informed th UNIDO has released a portion the ₹18 crore which it hi offered last year. The funds w be spent on research facility.

Karbanda also added that t hurdles in setting up the pr posed cycle valley in the city h been cleared and the up comi units will now be establish there. "We have also offere the Japanese delegation t set up their own centre in t city, for which 40 to100 acre of land will be arranged," said.

Hindustan Times, 16 Feb 2018

Coverage of UNIDO study tour to China

China tech boost for cycle industry, says UNIDO

LUDHIANA, JULY 11

The United Nations' Industrial Development Organisation (UNIDO) took a delegation of the bicycle industry in Ludhiana to China recently. China ranks number one in manufacturing bicycles in the world.

Avtar Singh Bhogal and Pradeep Wadhawan — the two members from the United Cycle Parts Manufacturers' Association (UCPMA) stayed in China for about five days.

They said if the technology was brought to India, the productivity would be enhanced and the bicycle industry would get a boost.

Talking to *The Tribune*, Avtar Singh Bhogal of Bhoga Sons said it was a beneficial tour as far as bicycle industry was concerned.

"The coming trend is of aluminium and carbon cycles, but there is a need to study the in depth technology used in manufacturing lightweight bicycles. UNIDO had sponsored the tour and took us to various research and development centres. It was a nice exposure and we learnt a lot about their latest technology," said Bhogal.

The UCPMA is hopeful that UNIDO will provide aid for boosting bicycle industry here. "UNIDO is a famous organisation, which also provides aid. If the aid is given to us, we will benefit by bringing in latest technology in manufacturing light-weight bicycles. Further, we can sign MoUs with China for collaboration," said Bhogal. — TNS

Punjab Tribune, 11 July 2018

Coverage of dissemination to industry after UNIDO study tour to China

यूनाइडो से हाई एंड टेक्नोलॉजी अपडेट होगा आरएंडडी सेंटर

सॉइकिल इंडस्ट्री की बेहतरी के लिए जल्द होगी यूसीपीएमए और एआईसीएमए की जॉइंट मीटिंग

राजस्थान से आए किसानों को खेती तकनीक की जानकारी देते पीयूष के महिर।

कहा- किसी भी मदद और सर्विस के लिए आरएंडडी सेंटर से करें संपर्क

बिजनेस रिपोर्टर | लुधियाना

चाइना से लौटकर आए यूसीपीएमए के डेलीगेशन ने सोमवार को अपना अनुभव शेयर को एक मीटिंग यूसीपीएमए भवन में रखी। इस मीटिंग की अगुवाई यूसीपीएमए के वाइस प्रधान प्रदीप वधावन, यूसीपीएमए के एडवाइजर अवतार सिंह भोगल, एआईसीएमए के महासचिव केवी ठाकुर, आरएंडडी सेंटर लुधियाना के मैनेजर खान ने की।

इस डेलीगेशन ने अपने चाइना दौरे के अनुभव अन्य मेंबर्स से शेयर करते कहा कि हमारी और चाइना के आरएंडडी सेंटर और टेस्टिंग लैब में बहुत बड़ा अंतर है। वहां सरकार की ओर से इंडस्ट्री की मदद को बड़े-बड़े शोरूम बनाकर दिए गए हैं। उन्होंने कहा कि साइकिल इंडस्ट्री की बेहतरी के लिए जल्द यूसीपीएमए और एआईसीएमए की जॉइंट मीटिंग करवाई जाएगी और यूनाईडो की भी पूरी मदद ली जाएगी। उन्होंने कहा कि यूनाईडो से हाई एंड साइकिल टेक्नोलॉजी लेकर यहां के आरएंडडी सेंटर अपडेट किए जाएंगे। उन्होंने इंडस्ट्रियलिस्ट्स से अपील करते कहा कि वे साइकिल इंडस्ट्री से संबंधित किसी भी मदद और सर्विस के लिए आरएंडडी सेंटर से सहायता ले सकते हैं।

Business Reporter, 30 July 2018

Coverage of UNIDO study tour to China

CEVT website

Coverage of visit Japanese experts to Ludhiana

ਯੂ.ਸੀ.ਪੀ.ਐਮ.ਏ. ਵਿਖੇ ਯੂਨੀਡੋ ਦੇ ਵਫ਼ਦ ਨਾਲ ਦਿਖਾਈ ਦੇ ਰਹੇ ਪ੍ਰਧਾਨ ਇੰਦਰਜੀਤ ਸਿੰਘ ਨਵਯੁੱਗ, ਮਨਜੀਤ ਸਿੰਘ ਧਾਲਸਾ, ਅਵਤਾਰ ਸਿੰਘ ਭੋਗਲ ਤੇ ਹੋਰ।

ਯੂਨੀਡੋ ਦੇ ਵਫ਼ਦ ਤੇ ਯੂ.ਸੀ.ਪੀ.ਐਮ.ਏ. ਦੀ ਮੀਟਿੰਗ

ਲੁਧਿਆਣਾ, 15 ਫ਼ਰਵਰੀ (ਪੁਨੀਤ ਬਾਵਾ)-ਯੂਨਾਈਟਿਡ ਨੇਸ਼ਨਸ ਇੰਡਸਟਰੀਅਲ ਡਿਵੈਲਪਮੈਂਟ ਆਰਗੇਨਾਈਜੇਸ਼ਨ (ਯੂਨੀਡੋ) ਦੇ ਇਕ ਉੱਚ ਪੱਧਰੀ ਵਫ਼ਦ ਵਲੋਂ ਓ.ਐਡ ਐਮ. ਕੰਪਨੀ ਲਿਮਟਿਡ ਦੇ ਕਾਰਜਕਾਰੀ ਚੇਅਰਮੈਨ ਤੇ ਸਾਈਕਲ ਮਾਹਿਰ ਤਕਾਸ਼ੀ ਨਾਗਾਹੋਰੀ, ਸੀਨੀਅਰ ਸਨਅਤੀ ਵਿਕਾਸ ਅਧਿਕਾਰੀ ਯੂਨੀਡੋ ਪ੍ਰੋਜੈਕਟ ਮੈਨੇਜਰ ਐਂਡਰਸ ਇਸਕਸੰਨ ਤੇ ਪ੍ਰੋਜੈਕਟ ਸਹਾਇਕ ਯੂਨੀਡੋ ਸ਼ਰਧਾ ਸ੍ਰੀਵਾਤ ਦੀ ਅਗਵਾਈ 'ਚ ਯੂਨਾਈਟਿਡ ਸਾਈਕਲ ਐਂਡ ਪਾਰਟਸ ਮੈਨੂੰਫੈਕਚਰਜ਼ ਐਸੋਸੀਏਸ਼ਨ (ਯੂ.ਸੀ.ਪੀ.ਐਮ.ਏ.) ਦਾ ਦੌਰਾ ਕੀਤਾ ਗਿਆ। ਮੀਟਿੰਗ 'ਚ ਸਾਈਕਲ ਸਨਅਤਾਂ ਨਾਲ ਸਬੰਧਿਤ ਸਮੱਸਿਆਵਾਂ ਤੇ ਭਵਿੱਖ ਦੀਆਂ ਸੰਭਾਵਨਾਵਾਂ ਬਾਰੇ ਵਿਚਾਰ-ਵਟਾਂਦਰਾ ਕੀਤਾ ਗਿਆ। ਪ੍ਰਧਾਨ ਇੰਦਰਜੀਤ ਸਿੰਘ ਨਵਯੁੱਗ ਨੇ ਸਾਈਕਲ ਸਨਅਤਾਂ ਨੂੰ ਅੱਜ ਆਧੁਨਿਕ ਸਕੂਲਾਂ ਨਾਲ ਲੈਸ ਕਰਨ ਤੇ ਤਕਨਾਲੋਜੀ ਪੱਖੋਂ ਡੂੰਗਲ ਤੇ ਮਨਜੀਤ ਸਿੰਘ ਧਾਲਸਾ ਨੇ ਕਿਹਾ ਕਿ ਭਾਰਤ ਵਿਚ ਸ਼ੀਮਾਨੋ ਵਾਂਗ ਹਾਈ ਐਂਡ ਕਲਪੁਰਜ਼ੇ ਬਣਾਉਣ ਦਾ ਭਾਰਤ ਵਿਚ ਸਾਧਨ ਉਪਲਾਧ ਪਲਾਂਟ ਲੱਗਣਾ ਚਾਹੀਦਾ ਹੈ ਤਾਂ ਜੋ ਜੋ ਕਲਪੁਰਜ਼ੇ ਹੋਰਨਾਂ ਮੁਲਕਾਂ ਆਦਿਦੇ ਪਨ, ਉਹ ਕਲਪੁਰਜ਼ੇ ਭਾਰਤ ਵਿ ਹੀ ਬਣਾਏ ਜਾ ਸਕਣ। ਉਨ੍ਹਾਂ ਕਿਹਾ ਕਿ ਦਿਹ ਰੁਝਾਨ ਭਾਰਤੀ ਸਾਈਕਲ ਸਨਅਤ ਕੋਲੋ ਬਾਜ਼ਾਰ ਦੇ ਨਾਲ ਮੁਕਾਬਲਾ ਕਰ ਯੋਗ ਹੋ ਸਾਕੇਗੀ। ਉਨ੍ਹਾਂ ਖੇਲ ਤੇ ਕਿਹਾ ਵੱਖਰ ਵਿਚ ਕੌਮਾਂਤਰੀ ਫ਼ਰਟਵੱਰਾ ਦਾ ਸਾ ਵਾਲੇ ਉਪਾਧਾਂ ਦੀ ਪਰਖ ਕਰਕੇ ਉਸ ਦੁਨੀਆਂ ਦੇ ਵੱਖ-ਵੱਖ ਕੋਨਿਆਂ ਵਿ ਵੱਖਰ ਯੋਗ ਬਣਾਉਣ ਦਾ ਹੀ ਪ੍ਰਪਾਰ ਕਰਨਾ ਚਾਹੀਦਾ ਹੈ। ਇਸ ਮੌਕ ਐਚ.ਐਸ.ਡੀ.ਸੀ. ਸਨਅਤ ਮੈਨੇਜਰ ਖੇਲ ਤੇ ਵਿਕਾਸ ਕੌਂਸਲ ਲੁਧਿਆਣਾ, ਪ੍ਰਦੀਪ ਕੁਮਾਰ ਵਧਾਵਨ ਸੀਨੀਅਰ ਮੀਤ ਪ੍ਰਧਾਨ, ਰਾਜਿੰਦਰ ਸਿੰਘ ਪ੍ਰਧਾਨ, ਕੇ.ਵੀ. ਠਾਕੁਰ, ਅੰਬੂਤ ਰਾਮ ਗੁਪਤਾ ਵਿੱਤ ਸਕੱਤਰ, ਟੀ.ਪੀ. ਸਿੰਘ, ਵਾਲੀਏ ਖਾਨ, ਤੇਜਿਦਰ ਸਿੰਘ ਪ੍ਰਧਿਪਕ ਖੇਲ ਤੇ ਵਿਕਾਸ ਕੌਂਸਲ ਲੁਧਿਆਣਾ ਨੇ ਕਿਹਾ ਕਿ ਭਾਰਤੀ ਸਾਈਕਲ ਸਨਅਤਾਂ ਨੂੰ ਵਿਸ਼ਵ ਦਾ ਹਾਣੀ ਬਣਾਉਣ ਲਈ ਤੇ ਉਸ ਨੂੰ ਮੁਕਾਬਲਾ ਕਰਨ ਲਈ ਇਕ ਜੁੱਟ ਹੋ ਕੇ ਕੰਮ ਕਰਨਾ ਸਮੇਂ ਦੀ ਲੋੜ ਹੈ। ਉਨ੍ਹਾਂ ਕਿਹਾ ਕਿ ਸੰਗਠਨ ਸਮੂਹਿਕ ਯਤਨ ਨਾ ਕੀਤੇ ਗਏ, ਤਾਂ ਭਾਰਤ ਦੀ ਆਰਥਿਕਤਾ ਲੜਖੜਾ ਜਾਵੇਗੀ ਅਤੇ ਸਨਅਤਕਾਰਾਂ ਨੂੰ ਮੰਦਹਾਲੀ ਦਾ ਸਾਹਮਣਾ ਕਰਨਾ ਪਵੇਗਾ। ਉਨ੍ਹਾਂ ਕਿਹਾ ਕਿ ਯੂਨੀਡੋ ਸਨਅਤਕਾਰਾਂ ਦੀ ਹਰ ਪੱਖੋਂ ਸਹਾਇਤਾ ਕਰਨ ਲਈ ਤਿਆਰ ਖੜਾ ਹੈ। ਸਨਅਤਕਾਰ ਅਵਤਾਰ ਸਿੰਘ ਭੋਗਲ ਤੇ ਮਨਜੀਤ ਸਿੰਘ ਧਾਲਸਾ ਨੇ ਕਿਹਾ ਕਿ ਭਾਰਤ ਵਿਚ ਸ਼ੀਮਾਨੋ ਵਾਂਗ ਹਾਈ ਐਂਡ ਕਲਪੁਰਜ਼ੇ ਬਣਾਉਣ ਦਾ ਭਾਰਤ ਵਿਚ ਸਾਧਨ ਉਪਲਬਧ ਪਲਾਂਟ ਲੱਗਣਾ ਚਾਹੀਦਾ ਹੈ ਤਾਂ ਜੋ ਜੋ ਕਲਪੁਰਜ਼ੇ ਹੋਰਨਾਂ ਮੁਲਕਾਂ ਆਦਿ ਦੇ ਪਨ, ਉਹ ਕਲਪੁਰਜ਼ੇ ਭਾਰਤ ਵਿ ਹੀ ਬਣਾਏ ਜਾ ਸਕਣ। ਉਨ੍ਹਾਂ ਕਿਹਾ ਕਿ ਦਿ ਰੁਝਾਨ ਭਾਰਤੀ ਸਾਈਕਲ ਸਨਅ ਕੋਲੋ ਬਾਜ਼ਾਰ ਦੇ ਨਾਲ ਮੁਕਾਬਲਾ ਕ ਯੋਗ ਹੋ ਸਾਕੇਗੀ। ਉਨ੍ਹਾਂ ਖੇਲ ਤੇ ਕਿ ਵੱਖਰ ਵਿਚ ਕੌਮਾਂਤਰੀ ਫ਼ਰਟਵੱਰਾ ਦਾ ਸ ਵਾਲੇ ਉਪਾਧਾਂ ਦੀ ਪਰਖ ਕਰਕੇ ਉਸ ਦੁਨੀਆਂ ਦੇ ਵੱਖ-ਵੱਖ ਕੋਨਿਆਂ ਵਿ ਵੱਖਰ ਯੋਗ ਬਣਾਉਣ ਦਾ ਹੀ ਪ੍ਰਪਾਰ ਕ ਨਾ ਚਾਹੀਦਾ ਹੈ। ਇਸ ਮੌਕ ਐਚ.ਐਸ.ਡੀ.ਸੀ. ਸਨਅਤ ਮੈਨੇਜ ਖੇਲ ਤੇ ਵਿਕਾਸ ਕੌਂਸਲ ਲੁਧਿਆਣਾ, ਪ੍ਰਦੀ ਵਧਾਵਨ ਸੀਨੀਅਰ ਮੀਤ ਪ੍ਰਧਾ ਸਿੰਘ ਪ੍ਰਧਾਨ, ਕੇ.ਵੀ. ਠਾਕੁਰ, ਅੰਬੂਤ ਰਾਮ ਗੁਪਤਾ ਵਿੱਤ ਸਕੱਤਰ, ਟੀ.ਪੀ. ਸਿੰਘ, ਵਾਲੀਏ ਖਾਨ, ਤੇਜਿਦਰ ਸਿੰਘ ਪ੍ਰਧਿਪਕ ਖੇਲ ਤੇ ਵਿਕਾਸ ਕੌਂਸਲ ਲੁਧਿਆਣਾ ਨੇ ਕਿਹਾ ਕਿ ਭਾਰਤੀ ਸਾਈਕਲ ਸਨਅਤਾਂ ਨੂੰ ਵਿਸ਼ਵ ਦਾ ਹਾਣੀ ਬਣਾਉਣ ਲਈ ਤੇ ਉਸ ਨੂੰ ਮੁਕਾਬਲਾ ਕਰਨ ਲਈ ਇਕ ਜੁੱਟ ਹੋ ਕੇ ਕੰਮ ਕਰਨਾ ਸਮੇਂ ਦੀ ਲੋੜ ਹੈ। ਉਨ੍ਹਾਂ ਕਿਹਾ ਕਿ ਸੰਗਠਨ ਸਮੂਹਿਕ ਯਤਨ ਨਾ ਕੀਤੇ ਗਏ, ਤਾਂ ਭਾਰਤ ਦੀ ਆਰਥਿਕਤਾ ਲੜਖੜਾ ਜਾਵੇਗੀ ਅਤੇ ਸਨਅਤਕਾਰਾਂ ਨੂੰ ਮੰਦਹਾਲੀ ਦਾ ਸਾਹਮਣਾ ਕਰਨਾ ਪਵੇਗਾ। ਉਨ੍ਹਾਂ ਕਿਹਾ ਕਿ ਯੂਨੀਡੋ ਸਨਅਤਕਾਰਾਂ ਦੀ ਹਰ ਪੱਖੋਂ ਸਹਾਇਤਾ ਕਰਨ ਲਈ ਤਿਆਰ ਖੜਾ ਹੈ। ਸਨਅਤਕਾਰ ਅਵਤਾਰ ਸਿੰਘ ਭੋਗਲ ਤੇ ਮਨਜੀਤ ਸਿੰਘ ਧਾਲਸਾ ਨੇ ਕਿਹਾ

Business Reporter, 30 July 2018

Coverage of dissemination to industry after UNIDO study tour to China

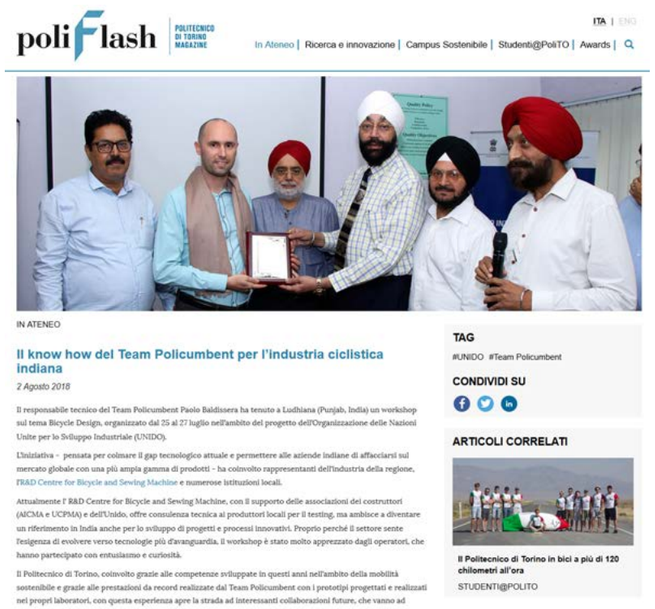
ਯੂਸੀਪੀਐਮਏ ਦੀ ਬੈਠਕ ਵਿਚ ਉਪਸਥਿਤੀ ਨੂੰ ਸੰਬੋਧਿਤ ਕਰਦੇ ਹੁਏ ਅਵਤਾਰ ਸਿੰਹ ਭੋਗਲ ਵ ਅਨ੍ਯ • ਜਾਗਰਣ

उद्यमियों संग युनिडो चीन प्रोजेक्ट पर हुआ विचार

जागरण संवाददाता, लुधियाना : यूनाइटेड साइकिल एंड पार्ट्स मैन्यूफेक्चरर एसोसिएशन (यूसीपीएमए) की ओर से हाली में युनिडो के चीन प्रोजेक्ट दौरे पर गए उद्यमियों का रूबरू कार्यक्रम गिल रोड स्थित कार्यालय में आयोजित किया गया। सीनियर उपाध्यक्ष प्रदीप वधावन की अध्यक्षता में हुए इस कार्यक्रम में यूसीपीएमए अवतार सिंह भोगल, आल इंडिया साइकिल मैन्यूफेक्चरर एसोसिएशन के जनरल सेक्रेटरी डॉ. केवी ठाकुर ने वहां के प्रोजेक्ट को उद्यमियों संग शेयर किया। इस दौरान उन्हें बदलते दौर के साथ हो रहे बदलावों के बारे में विस्तार से बताया गया कि किस तरह दूसरे देश आरएंडडी और टेस्टिंग लैब पर फोकस कर रहे हैं। उन्होंने कहा कि भारतीय साइकिल उद्योग के लिए विदेशी मार्केट के साथ-साथ घरेलू बाजार में भी भारी स्कोप है। इस दौरान युनिडो ने भारत में बेहतरीन आरएंडडी सेंटर और लैब के लिए सहयोग देने की बात भी कही।

CEVT website

Coverage of workshop on 'Bicycle design'



poliFlash | POLITECNICO DI TORINO MAGAZINE

ITA | ENG

In Ateneo | Ricerca e innovazione | Campus Sostenibile | Studenti@PoliTO | Awards |

IN ATENEO

Il know how del Team Policumbent per l'industria ciclistica indiana

2 Agosto 2018

Il responsabile tecnico del Team Policumbent Paolo Baldissera ha tenuto a Ludhiana (Punjab, India) un workshop sul tema Bicycle Design, organizzato dal 25 al 27 luglio nell'ambito del progetto dell'Organizzazione delle Nazioni Unite per lo Sviluppo Industriale (UNIDO).

L'iniziativa - pensata per colmare il gap tecnologico attuale e permettere alle aziende indiane di affacciarsi sul mercato globale con una più ampia gamma di prodotti - ha coinvolto rappresentanti dell'industria della regione, l'R&D Centre for Bicycle and Sewing Machine e numerose istituzioni locali.

Attualmente l' R&D Centre for Bicycle and Sewing Machine, con il supporto delle associazioni dei costruttori (AICMA e UCPMA) e dell'Unido, offre consulenza tecnica ai produttori locali per il testing, ma ambisce a diventare un riferimento in India anche per lo sviluppo di progetti e processi innovativi. Proprio perché il settore sente l'esigenza di evolvere verso tecnologie più d'avanguardia, il workshop è stato molto apprezzato dagli operatori, che hanno partecipato con entusiasmo e curiosità.

Il Politecnico di Torino, coinvolto grazie alle competenze sviluppate in questi anni nell'ambito della mobilità sostenibile e grazie alle prestazioni da record realizzate dal Team Policumbent con i prototipi progettati e realizzati nei propri laboratori, con questa esperienza apre la strada ad interessanti collaborazioni future, che vanno ad aggiungersi alle tante iniziative in ambito di internazionalizzazione e di trasferimento tecnologico dell'Ateneo.

TAG

#UNIDO #Team Policumbent

CONDIVIDI SU

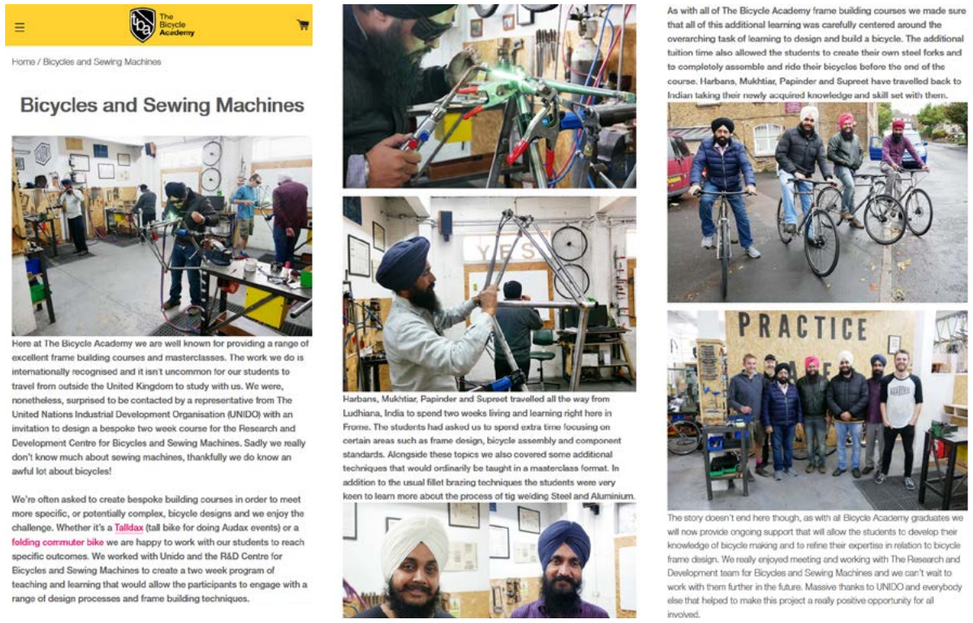
ARTICOLI CORRELATI

Il Politecnico di Torino in bici a più di 120 chilometri all'ora

STUDENTI@POLITO

Poliflash, 02 Aug. 2018

Coverage of fellowship training at The Bicycle Academy (TBA)



Home / Bicycles and Sewing Machines

Bicycles and Sewing Machines

Here at The Bicycle Academy we are well known for providing a range of excellent frame building courses and masterclasses. The work we do is internationally recognised and it isn't uncommon for our students to travel from outside the United Kingdom to study with us. We were, nonetheless, surprised to be contacted by a representative from The United Nations Industrial Development Organisation (UNIDO) with an invitation to design a bespoke two week course for the Research and Development Centre for Bicycles and Sewing Machines. Sadly we really don't know much about sewing machines, thankfully we do know an awful lot about bicycles!

We're often asked to create bespoke building courses in order to meet more specific, or potentially complex, bicycle designs and we enjoy the challenge. Whether it's a Talldax (tall bike for doing Audax events) or a folding commuter bike we are happy to work with our students to reach specific outcomes. We worked with Unido and the R&D Centre for Bicycles and Sewing Machines to create a two week program of teaching and learning that would allow the participants to engage with a range of design processes and frame building techniques.

Harbans, Mukhtiar, Papinder and Supreet travelled all the way from Ludhiana, India to spend two weeks living and learning right here in Frome. The students had asked us to spend extra time focusing on certain areas such as frame design, bicycle assembly and component standards. Alongside these topics we also covered some additional techniques that would ordinarily be taught in a masterclass format. In addition to the usual fillet brazing techniques the students were very keen to learn more about the process of tig welding Steel and Aluminium.

As with all of The Bicycle Academy frame building courses we made sure that all of this additional learning was carefully centered around the overarching task of learning to design and build a bicycle. The additional tuition time also allowed the students to create their own steel forks and to completely assemble and ride their bicycles before the end of the course. Harbans, Mukhtiar, Papinder and Supreet have travelled back to Indian taking their newly acquired knowledge and skill set with them.

The story doesn't end here though, as with all Bicycle Academy graduates we will now provide ongoing support that will allow the students to develop their knowledge of bicycle making and to refine their expertise in relation to bicycle frame design. We really enjoyed meeting and working with The Research and Development team for Bicycles and Sewing Machines and we can't wait to work with them further in the future. Massive thanks to UNIDO and everybody else that helped to make this project a really positive opportunity for all involved.

TBA website

Coverage of workshop on 'e-bike'

Three-day workshop on e-bike

TRIBUNE NEWS SERVICE

LUDHIANA, NOVEMBER 20

A three-day workshop on e-bike was organised at the R&D Centre for Bicycle and Sewing Machine, Ludhiana, by (United Nations Industrial Development Organisation) UNIDO recently.

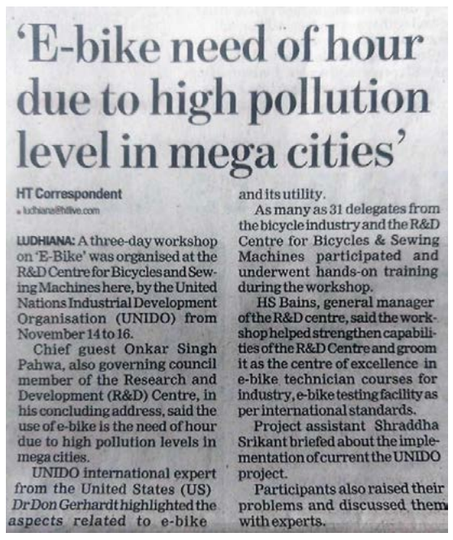
During the workshop, UNIDO international expert from US, Dr Don Gerhardt, highlighted significant aspects related to e-bike.

As many as 31 delegates from the bicycle industry representing UCPMA, AICMA and R&D Centre for Bicycle and Sewing Machine participated and underwent hands on training during the workshop.

HS Bains, general manager, said the workshop shall initiate and strengthen capabilities of the R&D centre and develop it as centre of excellence in areas of training in e-bike technician courses for industry, complete e-bike testing facility as per international standards and help industry to develop e-bikes by providing assistance in testing of batteries, motors and controllers at the R&D centre.

Punjab Tribune, 20 Nov. 2018

Coverage of workshop on 'e-bike'



'E-bike need of hour due to high pollution level in mega cities'

HT Correspondent

LUDHIANA: A three-day workshop on 'E-Bike' was organised at the R&D Centre for Bicycles and Sewing Machines here, by the United Nations Industrial Development Organisation (UNIDO) from November 14 to 16.

Chief guest Onkar Singh Pahwa, also governing council member of the Research and Development (R&D) Centre, in his concluding address, said the use of e-bike is the need of hour due to high pollution levels in mega cities.

UNIDO international expert from the United States (US) Dr Don Gerhardt highlighted the aspects related to e-bike and its utility.

As many as 31 delegates from the bicycle industry and the R&D Centre for Bicycles & Sewing Machines participated and underwent hands-on training during the workshop.

HS Bains, general manager of the R&D centre, said the workshop helped strengthen capabilities of the R&D Centre and groom it as the centre of excellence in e-bike technician courses for industry, e-bike testing facility as per international standards.

Project assistant Shraddha Srikant briefed about the implementation of current the UNIDO project.

Participants also raised their problems and discussed them with experts.

Hindustan Times, 20 Nov 2018

Coverage of UNIDO study tour to Europe

BIKE europe
Connecting professionals

NEWS SALES & TRENDS LAWS & REGULATIONS INDUSTRY & RETAIL EVENTS

industry retail sports & cycling

News Article 4 Dec 2018

Indian Industry Delegation Visits CONEBI and Portugal Bike Value

Industry- & Retail Organizations

BRUSSELS, Belgium – The first stop of the European tour of the Indian delegation representing the country's bicycle and components manufacturers was the CONEBI (Confederation of the European Bicycle Industry) office in Brussels yesterday. Manuel Marsilio who represented CONEBI as well as WBIA (World Bicycle Industry Association) welcomed All India Cycle Manufacturers Association (AICMA) delegation leader Dr. Thakur.

CONEBI GM Manuel Marsilio welcomed AICMA delegation leader Dr. Thakur. – Photo Bike Europe

The delegation also attended yesterday's Transport and Tourism Committee meeting at the European Parliament. Later this week the six delegates will travel to Portugal to visit the bicycle companies in the Bike Valley, like Miranda, Triangles Rodi. The tour will be concluded in Fulda, Germany meeting Erhard Büchel, CONEBI President and CEO of Büchel GmbH & Co.

United Nations Industrial Development Organization

The European tour has been organized by the United Nations Industrial Development Organization who is currently implementing an extensive inclusive and sustainable program for India's bicycle industry.

India's bicycle industry organization recently joined the World Bicycle Industry Association (WBIA) after attending the WBIA General Assembly which was held last July. WBIA was founded in December 2017 and represents the Bicycle, Pedal-Assist E-Bike and Parts & Accessories Industry on global levels. They participate in the World Forum for the Harmonization of Vehicle Regulations, organised by the United Nations Economic Commission for Europe. WBIA also takes part in several Working Parties on General Safety Provisions, Passive Safety, Lighting and Light-Signaling, Autonomous and Connected Vehicles.

Next to AICMA, other WBIA Members are the Japan Bicycle Association, The Bicycle Product Suppliers Association from the United States, the Mexican Association of Bicycle Manufactures, Taiwan Bicycle Association and the Confederation of the European Bicycle Industry.

Published by Jan-Willem van Schaik- on 4 Dec 2018
last update: 4 Dec 2018

Bike Europe, 04 Dec. 2018

Coverage of UNIDO study tour to Europe

RadMarkt
Das Branchenmagazin

HOME NACHRICHTEN HÄNDLERSERVICE ZEITSCHRIFT MARKTPLÄTZE

Büchel: Gastgeber für UN-Delegation aus Indien

14.12.2018

Die indische Abordnung mit Bürgermeister Ralph Groß, Geschäftsführer Ullrich Blanc und Firmeninhaber Erhard Büchel in Barchfeld.

Hoher Besuch aus Indien zu Gast bei Büchel in Barchfeld: Die von Shraddha Srikant geleitete indische Delegation der Organisation der Vereinten Nationen für Industrielle Entwicklung (UNIDO) hatte sich gemeinsam mit weiteren Vertretern der indischen Fahrradindustrie sowie dem Generalsekretär des indischen Zweiradverbandes zu einem Besuch der Büchel-Gruppe eingefunden.

In seiner Eigenschaft als Präsident des Welt-Fahrradindustrie-Verbandes WBIA) begrüßte Geschäftsführer Erhard Büchel die Abordnung in Deutschland. Grund des Treffens war der Wunsch der Inder, einen Einblick in die europäische Fahrrad-Produktion zu erhalten. Nach einem Aufenthalt in Brüssel am Sitz der EU-Kommission und in Portugal trafen sich die Besucher daher zuerst am Büchel-Firmensitz in Fulda. Von dort aus ging es dann nach einer Präsentation über die europäischen Marktgegebenheiten, weiter nach Barchfeld zu fahren.

In Barchfeld ist sowohl der Büchel-Produktionsstandort für Fahrradkomponenten und Automobilteilen angesiedelt als auch das -Zentrallager. Vor Ort wurde die indische Delegation auch von Bürgermeister Ralph Groß und Büchel-Geschäftsführer Ullrich Blanc begrüßt. Blanc erläuterte den Gästen ausführlich die einzelnen Schritte der Produktion – und gab der Gruppe somit einen Einblick in die modernen europäischen Fertigungsverfahren (inklusive Industrie 4.0).

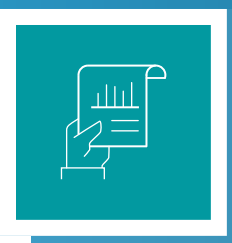
In Indien werden zurzeit 17 Millionen Fahrräder produziert. Die größten Produzenten sind Hero Cycles und Avon Cycles. Zusammen zeichnen sie sich für rund zwei Drittel der gesamtindischen Fahrradherstellung verantwortlich. Beide Unternehmen waren - ebenso wie führende Komponentenhersteller – auf Geschäftsleitungsebene in der Gruppe vertreten.

Die Teilnehmer zeigten sich außerst beeindruckt von den hohen Qualitätsstandards und dem Automatisierungsgrad der Büchel-Produktion. Mit der Vereinbarung über eine zukünftige Kooperation mit dem indischen Fahrradverband wurde das Ziel des Besuches der UNIDO-Delegation voll erfüllt.

Übrigens: Seit Ende 2016 hat sich das Unternehmen Büchel im Rahmen eines Joint-Ventures ebenfalls auf dem indischen Markt etabliert. Produziert werden Reflektoren sowie andere Fahrradkomponenten für indische Premium-Fahrräder. Das gegenwärtige Portfolio wird konstant erweitert.

Text: Jo Beckendorff/Büchel, Foto: Büchel

RadMarkt, 14 Dec. 2018



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Vienna International Centre · P.O. Box 300 · 1400 Vienna · Austria
Tel.: (+43-1) 26026-0 · environment@unido.org
www.unido.org