

EXECUTIVE SUMMARY

- 0.1 The annual indigenous production of mopeds during last 4 decades has been as below :

	Nos Produced	
1956-60	1,525 (Average annual production)	
1961-65	2,408	(- do -)
1966-70	9,266	(- do -)
1971-75	25,573	(- do -)
1976-80	58,922	(- do -)
1981-85	3,72,226	(- do -)
1986	4,49,792	
1987	4,75,607	
1988	5,06,565	

The growth of production, particularly after 1980, has been quite rapid.

- 0.2 90% of the moped production, in India, is contributed by 3 companies, namely, Kinetic Engineering, Sundaram Clayton and Majestic Auto, all of whom do not have foreign collaboration. These firms are producing mopeds, which were reverse engineered from foreign models and adopted to Indian conditions, based on in-house R&D efforts.
- 0.3 However, Majestic Auto has set up another plant, which is producing a foreign collaboration based model, namely, Hero Puch, in collaboration with Steyr Daimler Puch of Austria. This vehicle, which has an engine displacement of 65 cc and for that reason, can not be strictly classified as a moped, has a production level of 26000 nos (1989-90). This model has most upto date features and carries a much higher price as compared to indigenous technology (IT) based models.
- 0.4 The popularity of IT based models, is presumably because of the low price, which is often as low as 50% of f.c. based model prices. Technologically, f.c. based models are superior and have many state of the art features, such as higher engine output, higher compression ratio, electric and kick starting facilities, disc brakes, cast light alloy wheels, variable speed drives, more comprehensive range of auto electricals, such as, blinkers, etc., fitted on them.
- 0.5 As a result of the competition from f.c. based models, I.T. based models also started incorporating many new features, such as, kick start, variable speed drives, etc. Therefore, it can be said, that even though the f.c. based models did not contribute much to moped production in India, they did catalyse technol-

ogy upgradation of mopeds in India. Therefore it appears to be worth while keeping the technology import window open.

- 0.6** India probably makes the cheapest (if the impact of duties and taxes is excluded) but technologically the most out dated mopeds in the world. The capital equipment base of moped industry is also indigenous, which perhaps is an important factor contributing to the low price of indigenous mopeds. There is an excellent potential for export of mopeds if the product technology of the I.T based models is upgraded through a concerted effort by moped manufacturers. There is a need to evolve comprehensive set of measures, to promote technology upgradation for export of mopeds.
- 0.7** Because of the fact the mopeds, like scooters and motor cycles, use two stroke engines, which can let out, into exhaust, in unburnt or partially burnt form, upto 25% of the fuel input, they are a big source of pollution. It may be difficult to switch over to 4 stroke engines, because of less torque of such engines, on ungeared mopeds, but on geared mopeds their use is possible and thereby emission levels can be substantially reduced. Electronic fuel injection system for small two stroke petrol engines, is reported to be under development at AVL , Austria. Such injection systems are reported to be considerably effective in reducing pollution levels of two stroke engines. Therefore possibility of adoption of fuel injection systems on India mopeds need to be explored. If necessary the technology can be imported for such injection systems. Also effort should be made to replace mist lubrication of crank case parts based on lube oil addition to fuel, by pump circulated forced lubrication to obviate the need of mixing lube oil with fuel, as this will help in reducing pollution levels. Use of reed valves will also result as improving the fuel efficiency.
- 0.8** Some of f.c. based mopeds which were produced in India and whose production had come to near halt because of marketability or closure of collaborators plants, had some good state of the art features like: light alloy wheels, aluminum cylinder blocks, etc. Efforts should be made to encourage horizontal sale of such technology by original importers of the technology to other moped units.
- 0.9** ARAI is reported to be in a process of establishing a state of the art engine development facility at a considerable cost. Efforts should be made to persuade moped manufacturers to utilise the facility for upgradation of their engines.
- 0.10** Moped, because of its size and small engine ratings is basically a vehicle which is prone to high rates of wear, particularly, in respect of engine components. Moped manufacturers should try to use new materials such as ceramics, or hard metal castings etc, on critical components, to increase their service life and to bring down the incidence of repair and maintenance.
- 0.11** Moped production lines, because of the small size of moped components require small special purpose machine tools. Very few such machine tools are

in the production range of the established Indian machine tool manufacturers, like, HMT, etc. As a result moped industry has to turn to less reputed machine tool manufacturers for their requirement of machine tools. The quality of machine tools available from such manufacturers is not always satisfactory. Therefore, efforts must be made to persuade leading machine tool manufacturers to take up production of SPM's for moped industry.

- 0.12** Ergonomic and styling of mopeds has a considerable scope for improvement for better appearance and suitability to average Indian drivers.
- 0.13** A number of technologies are available in other sectors of industry in the country, which can be used to upgrade mopeds, such as, disc brakes, use of hard ferrite in magnetos, electronic ignition, better composition of rubbers for various moped components, etc. These should be used by moped industry to improve their products. If necessary selective imports of technology for moped components should be permitted.
- 0.14** There is a need for evolving comprehensive safety standards for mopeds and their components and ensuring their compliance by moped industry at design manufacturing stage.
- 0.15** There may be considerable scope for transferring technology for simple and cheap mopeds, as are being produced in India presently, to developing countries of Africa, Latin America, etc. This should be encouraged.
- 0.16** One reason for the commercial failure of many a f.c. based moped was that they were produced below economic levels of production. It is therefore essential that project economics for new moped projects should be carefully worked out so that projects can produce and sell at least 1,00,000 moped per annum, under existing market conditions of competition from IT based mopeds. If this criteria is not met by the new moped projects, their setting up may not be encouraged. In such a case where new moped projects are not forthcoming, and the indigenous moped industry needs international exposure, it may be worthwhile to permit import of mopeds. The indigenous moped industry has attained sufficient maturity to provide a tough competition to imports and, there by to keep the level of imports, within reasonable limits.