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NATIONAL DEFENCE PRODUCTION POLICY

Note: *This policy document provides a broad framework and guideline to all national stakeholders. In the light of this policy, all relevant Government ministries, divisions, departments, defence production organizations from public and private sectors, research establishments' as well academic institutions will set their respective goals, formulate their own procedures, instructions, rules and regulations.*

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VISION

To make **Pakistan one of the leading countries in defence production** by driving the defence industry through establishment of a **robust and collaborative defence production ecosystem** that meets both our **security imperatives** as well as export goals.

MISSION

To promote, support and augment **indigenous defence production** for attaining **self-reliance** in fulfilling **national needs** and enhancing **export potential**. Institutionalize need-driven R&D and develop a collaborative, financially prudent, and internationally compatible defence industry.

HISTORICAL OVERVIEW

1.1. Pakistan did not inherit even a single unit out of the sixteen (16) Ordnance Factories in erstwhile united India in 1947. The foundation of Pakistan's defence production industry was laid with the establishment of Pakistan Ordnance Factories at Wah (POF) in 1951. Thereafter, other entities have been established from time to time under Ministry of Defence (MoD) and other federal ministries which progressed and expanded in due course. Today Pakistan possesses huge defence industrial production cluster under Ministry of Defence Production (MoDP) wherein number of Defence Production Establishments (DPEs) including Pakistan Ordnance Factories (POF) comprising 12xFactories, Heavy Industries Taxila (HIT) comprising 8xFactories, Pakistan Aeronautical Complex (PAC) comprising 4xFactories, National Radio & Telecommunication Corporation (NRTC) comprising 5xSubsidiaries and Karachi Shipyard & Engineering Works (KS&EW) are working in public sector. Around 150xprivate industries are also successfully contributing towards defence production sector.

1.2. The Defence Production sector is progressively meeting requirements of armed forces thereby making them self-reliant and also facilitating Police, Civil Armed Forces/ Law Enforcement Agencies (CAFs/ LEAs). These factories are not only meeting the needs for other domestic users like aviation, communication, IT, transport and energy sectors, but also earning handsome foreign exchange through exports to friendly countries. The Defence Production sector provides thousands of technical/ non-technical jobs, along with provision of accommodation, health, education and other civic amenities to **many hundred thousand** people through its comprehensive Corporate Social Responsibility (CSR) regime thereby meaningfully contributing towards national development. Defence Production sector possesses huge potential not only to meet our future defence/ security demands but can further augment the national economy by making it more progressive, dynamic and vibrant through equipping it with state of the art technologies and modern production techniques thereby developing at par with modern nations.

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CHAPTER 2
OBJECTIVES

- 2.1. Defence Production Imperatives.** All Public and Private defence industries to ensure that, defence production primarily fulfil the defence needs/ security imperatives of Pakistan, while maximising production so as to enhance our export potentials.
- 2.2. Address Evolving Security Needs:** To continuously assess and adapt to evolving security requirements, accounting for global geopolitical changes and regional security challenges, staying vigilant and responsive to emerging threats and technological advancements. Develop and acquire futuristic and critical systems, platform and materials.
- 2.3. Foster Innovation through Research and Development:** To develop and acquire cutting-edge defence technologies to stay competitive and maintain a strategic edge, while fostering innovation to drive technological advancements. Promote synergy between the defence-related industry, academia and research institutions by driving innovation, harmonizing research efforts to develop state-of-the-art technologies (details at Annexure - A)..
- 2.4. Promote Self-Reliance through Indigenization:** To foster self-reliance by nurturing a strong indigenous defence industrial base to reduce dependence on foreign suppliers and promote national security interests by harnessing nationwide production facilities. Encourage the development of a local defence industrial base through incentives and supportive policies to ensure that relevant industries are protected.
- 2.5. Collaborations, Knowledge Sharing and Resource Sharing:** Promote collaborations, joint ventures, knowledge, infrastructure and resource sharing among and within public and private sectors as well as global defence industries to pool expertise and resources, bolstering domestic industrial and training capability.
- 2.6. Industrial Base Evaluation and Database.** Analyze the domestic defence industrial base to identify areas where capacity needs to be expanded or diversified. Maintain and regularly update a consolidated database of domestic industrial capabilities including research, testing, standardization, calibration facilities, product range and areas of core competency.
- 2.7. Development of Human Resource:** Invest in human resource development by providing world-class education, scholarships, training programs and regular refresher courses to nurture scientists, designers, manufacturers, technologists and down the ladder technicians into a highly skilled workforce.
- 2.8. Enhance Fiscal Responsibility:** Optimize procurement processes, maintain transparency and exercise fiscal responsibility, ensuring that resources are efficiently allocated and expended.

2.9. Support Economic Growth through Export Promotion: Leverage the defence industry to stimulate economic growth through export promotion and innovation, enhancing the nation's economic competitiveness. Showcasing of Pakistan's defence products, services and solutions in international defence exhibitions and streamlining of export authorization procedures. Introduction and optimum use of online tools and central portal for export promotion.

3.0. Self-Sustenance – Reduce Burden on National Exchequer: DPEs have been allowed to undertake commercial activities utilizing their surplus/ commercial potential through incorporation of Commercial Companies. Efforts shall be made to gradually move towards financial self-reliance with a targeted approach where in at least **10-15 % reduction** be obtained in annual budget allocations and meeting this shortfall through commercial activities especially the exports. The overall drive is likely to achieve complete self-sustenance in next 7-10 years.

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CHALLENGES FACED BY PUBLIC AND PRIVATE SECTORS

3.1. Introduction. Complex rules, regulations and procedures in setting up defence industries, comparative delayed return on investment, lack of investment, limited eco-system and lack of research and analysis to compete in international market are major drag/ challenges for defence related industries of Pakistan. These challenges are summarised in subsequent paras.

3.2. Legal and Procedural Challenges - Lack of Incentives. Numerous bureaucratic hurdles and policy barriers discourage investment. Non-existence of One-Window Operation is also a major impediment.

3.3. Challenges Faced by Public Defence Production Establishments (DPEs)

3.3.1 Need Based Production. Prime responsibility of DPEs is to produce defence related products to meet the needs of Armed Forces with limited leverage of export of surplus to reduce overheads. Over 90% products supplied to the Armed Forces are on cost-to-cost basis.

3.3.2. Budgetary Constraints. Production is budget bound with minimum or no leverage to enhance productivity. Limited budget for R&D, modernization of vintage plant and machinery, expansion, and Human Resource Development. Even depreciation cost of plant and machinery are not adequately considered.

3.3.3. Costing System/ Overheads. Decades old costing procedures and multiple overheads inclusions impede towards achieving the desired benefits as well as also curtail the anticipated financial gains.

3.3.4. Non Productive Overheads. Provision of medical, housing, security, pension, and other welfare facilities to employees' increases non-productive expenditure.

3.3.5. Complex Rules, Regulations and Procedures. Regulations and procedures (banking, NOCs etc) inhibit export initiatives and discourage fulfilling of defence goods' demands and orders from abroad.

3.3.6. Modernization/ Expansion. Machines and management system being vintage whereby requisite modernization and expansion is not prioritized, thus increasing reliance on induction of modern munitions through imports.

3.3.7. Non-adoption of International Standards. Defence industry has been transformed with cutting edge technologies being preferred world over. Indigenously developed high-end products may not always compete with the modern world.

3.3.8. Human Resource. The requisite skills and capabilities are often not found in the available pool. Moreover, the existing skilled manpower also depletes with time.

3.4. Challenges Faced by Private Sector

3.4.1. Inconsistent and Complex Policies. Public Private Partnership is thereby restricted to short-term/ small ventures.

3.4.2. Lack of Business Assurances. Private vendors require a long-term business assurance/ partnership before making investments.

3.4.3. Delayed Return on Investment. Defence production ventures are relatively slower in returning the dividends.

3.4.4. Limited and Non-diversified Industrial Base. Requisite industrial base (especially SMEs) to kick start big projects is inadequate.

3.4.5. Insufficient Funding. Soft loans and funds are not available to private sector for requisite R&D and industrial setup.

3.4.6 Tax Exemptions. Limited tax / duty exemptions offered to the private vendors.

3.4.7. Dearth of Human Resource. Required expertise/ skilled manpower in cutting edge technologies not available in human resource pool.

3.5. Ecosystem Limitations. Following major voids have been identified and is required to be addressed.

3.5.1 Lack of consistency, continuity and ownership.

3.5.2. Non-existence of long-term road map.

3.5.3. Weak Public-Private interface.

3.5.4. Low commercial earnings vis-a-vis the potential.

3.5.5. Non digitization and central database causing delays.

3.5.6. Absence of corporate culture.

3.5.7. Inefficient conflict resolution mechanism.

DEFENCE PRODUCTION POLICY CARDINALS

4.1. Introduction. Having thoroughly deliberated, objectively analyzed issues and challenges faced by country's defence related industries, it is imperative to discuss major cardinals of Defence Production Policy. As a dynamic document it will offer directions, guidelines and support all, to maximize existing production, venture in to modern means and technologies, establish new setups with a view to realize the stated vision "To **make Pakistan one of the leading countries in defence production** by driving the defence industry through establishment of a **robust, collaborative defence production ecosystem** that meets both our **security imperatives** as well as export goals". Defence production policy Cardinals are:-

4.2. Regulations, Procedure and Oversight. MoDP being line Ministry, will ensure that existing regulations and laws are aligned with the policy objectives. Any amendments required must be initiated to facilitate policy implementation. In addition, to establish an effective oversight mechanism to ensure a balance between national security and commercial aspects in defence industry. Following are important aspects in this regard:-

4.2.1 MoDP to lead as custodian to **overall articulate and execute policy Functions**. Act as the controlling agency directing and articulating national effort on all facets of defence production. MoDP to initiate necessary reforms and procedural changes to ensure and enable a robust environment.

4.2.1 Responsible for interpreting, steering, implementing and monitoring of policy execution.

4.2.2 Coordinate and reconcile short, mid and long-term production, procurement and purchase plans with tri-services.

4.3. Identification of Defence Production Goals. Identifying goals for the defence production sector involves considering various aspects of national security, industrial capacity and technological advancements. Specific goals with timeline must be set. These goals must include development of core technologies, which can drive indigenous development of critical systems for defence. Plans should be formulated focusing on following milestones:

4.3.1 Production to fulfil defence needs of Pakistan as well as for exports.

4.3.2 Defence product development through collaborative research.

4.3.3 R&D for customization and development of new products.

4.3.4 Development of Institutes/ Centres of Excellence (COE) for niche technologies.

4.4. Technology Assessment and Establishment of Defence Industries. Identify and prioritize niche and emerging defence technologies. This involves understanding emerging technologies, potential vulnerabilities, and the need to stay ahead in areas such as artificial intelligence, cyber warfare, and advanced weaponry. All stakeholders including Industries-must

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undertake necessary assessment and ensure measures and initiatives to remain in step with changing environment. Should any Public or Private Firm/ establishment/ Industrialist desires to establish new defence production industry. MoDP being line ministry to facilitate, fund (where necessary) and support establishment of new industries/ facilities in consultation with relevant ministries like Interior, Environment, Commerce & Industry, Finance, Federal entities/ CDA or provinces etc.

4.5. Identification of Critical Technologies. Critical technologies for Defence sector should be identified by entities of public and private sector and prioritized centrally under MoDP. In case of Transfer of Technology (ToT), it should preferably be for engineering processes rather than for development of products only. The machinery and assembly lines thus acquired should have greater tolerances and flexibility to incorporate manufacturing of variety of components.

4.6. Promotion of Collaborations and Joint Ventures. To accrue due benefits from advance world countries leading defence technology; local industry must be encouraged to undertake joint ventures, global collaborations to acquire crucial knowledge and technologies wherever possible. The overall aim should remain on gradual acquisition of complete technology and eventual indigenous development.

4.7. Human Resource Development (Quality engineers, institutes). Focus should be to inculcate professionalism, competence matched with international standards. Global collaborations, scholarships and exchange programs must be encouraged in this regard. Invest in human resource development programs to ensure the availability of skilled personnel for the Defence industry. Integration of technical academia especially the NUTECH University, NUST, HITEC, POF engineering University, Aviation City Kamra and other Engineering & Technology universities to make a unison cluster.

4.8. Data Analysis for Optimised Decision Support. Remarkable improvements in Artificial intelligence and Data science technologies in today's world have improved decision making. Effort must be made to compile and assess technical data available within every technical organization to make better use of data with data analysis techniques and technologies to make better decisions and save on cost.

4.9. Formulation of Indigenous Development Procedures. MoDP with its concerned Executive Departments (EDs) to formulate detailed Defence Production procedures separately from procurement procedures including the following:-

4.9.1. Special provisions for pre-tender short-listing and pre-qualification of local firms based on technical expertise in different fields and technologies.

4.9.2. Provision for Joint ventures among and within Public and Private sector firms as well as international firms with flexibility of fund sharing (complete & partial) for execution of projects.

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4.9.3. Provision for contract execution of different modules of a main project and product through Academia.

4.9.4. Provision of patency, intellectual property & proprietary rights on successful development of Defence products.

4.9.5. Testing and Trial procedures to facilitate induction of indigenously developed prototypes to encourage “**Made in Pakistan**” products.

4.9.6. Identify end-to-end parameters and embed the same in the plan to ensure smooth and successful series production of indigenous defence products.

4.10 Role of Armed Forces. Armed Forces Headquarters to ensure realistic analysis of intended equipment and generate short, mid and long-term requirements to assist and seek due support of Ministry of Defence production and its affiliated industries in preparation of annual/ long term procurement and indigenous production plans. Maximum effort should be on indigenous solutions, where possible.

4.11. Transfer of Technology (ToT) Policy for Defence Products. ToT needs to be rationalized and evaluated against important parameters of initial cost, long term economic viability, absorption capability and requirement of specialized human resource. Attributes and parameters be carefully crafted to maximize own advantage while catering for international policies, which protect intellectual property rights and prevent ‘forcing’ of ToT. Factor of available and willing suppliers of the required technology at the time of purchase may assume a decisive role while negotiating attributes of ToT. In all import indents involving large quantities and substantial capital, minimum 5-15 % quota (of the total contract cost) be kept for Indigenous Development as per any one or combination of the following models:-

4.11.1 Selective parts/ assemblies be manufactured and assembled by local industry.

4.11.2 Technological development in parallel industrial sector by the OEM.

4.11.3 Establishment of design houses in every defence production establishment for related research towards improvements, innovations and launching of own brands

4.11.4 Complete or partial in-country design/ manufacturing through ToT under license of the relevant OEMs (details at Annexure - B).

4.12. Defence Offset. The arrangement aims at offsetting financial burden of the ‘purchaser’ in the long term, through capability & capacity building of purchaser’s industry. Due consideration be given to long term economic viability, absorption capability and progressive self-reliance. Defence Offset where possible/ required to form part of defence procurement contracts.

4.13. Financial Incentives and Tax Rebates. Incentives for local defence industry are crucial to encourage growth, innovation and self-reliance in the sector. A facilitation cell for defence investors be established at MoDP to facilitate/ offer incentives for investments in defence sector.

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Special tax exemptions or rebates be deliberated to grant to local firms which successfully develop indigenous defence products.

4.14. Raw Materials & Machinery. To mitigate the challenge of non-availability and limitations in development of raw materials/ machinery essentially required for indigenous manufacturing, following should be adhered to:-

4.14.1. In-country exploration, extraction and refining of materials where necessary, in collaboration with Ministries of Mineral & Resources, Petroleum, other public or private mineral exploration/ refining establishments.

4.14.2. Efforts be made to export finished products instead of raw materials, particularly rare earth minerals.

4.14.3. Cases be deliberated/ finalized for tax exemptions on import of specified types of raw materials & machinery required to develop particular products under development contract.

4.14.4. Encourage in-country production of requisite machinery and Testing, Measuring and Diagnostics Equipment (TMDEs).

4.15. Supply Chain Resilience. All stakeholders to make all out efforts to assess the resilience of the defence supply chain. Ensure that essential components and materials are sourced domestically or from trusted allies to reduce vulnerabilities of disruptions in the global supply chain.

4.16. Public-Private Partnership (PPP). Encouraging public-private partnerships (PPPs) in the defence production sector involving a comprehensive strategy that combines government initiatives with the active participation of the private sector.

4.17. Quality Standards and Certifications. Meeting international standards and certifications for locally developed defence products is crucial to ensure the products are recognized as high-quality and compliant with global requirements (details at Annexure - C).

4.18. Patents and Intellectual Property Rights. Patents and intellectual property rights in the defence industry encourage research and development of advanced military technologies. This will drive innovation, leading to the creation of cutting-edge defence systems and capabilities. MoDP with relevant national departments to formalise procedures to safeguard/ formalise policy of Patents and Intellectual Property Rights (details at Annexure - D)..

4.19. Financial Prudence. Financial prudence in the defence production sector is essential to ensure that resources are managed economically, efficiently and effectively, especially in a sector, where costs can be high and budgets are often under scrutiny. All to ensure audit both by internal/ external/ renowned firms.

4.20. Commercialization. Commercialization plays a significant role in promoting the defence production industry by creating synergy between economic interests and national security. It's crucial to strike a balance between commercial interests and national security concerns. MoDP

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to ensure control mechanism while offering supportive Regulations for commercialization of defence technologies and products.

4.21. Defining Clear Roles and Responsibilities. All relevant stakeholders, including government agencies, Defence industry representatives, academia and research institutions must be engaged to ensure their understanding and support for the policy's goals. Roles and responsibilities of each stakeholder and agency involved in the implementation process must be clearly defined and communicated. All industries involved in defence manufacturing, specially Public/ State Owned industries to seek formal approval from MoDP for investments and engagements in other fields not relevant to their principle business/ assigned mission.

4.22. Performance Metrics and Evaluation. Evaluate key performance indicators (KPIs) to measure the policy's impacts and effectiveness of all related stakeholders. Line Ministry/ MoDP to approve KPIs to regularly evaluate the policy's outcomes against these KPIs.

4.23. Defence Industry Ecosystem. Public and Private defence production sector should be synergized to enhance optimal output through a well-orchestrated ecosystem thereby:-

- 4.23.1. Defining specific government role.
- 4.23.2. Identification of challenges and shortcomings for remedial measures.
- 4.23.3. R&D and innovation to remain high priority.
- 4.23.4. Encourage collaboration between government agencies, academia, research institutions and industry.

4.24. Establishment of a Defence Production Think Tank. A specialized think tank focused on defence production and related matters be established. This think tank will serve as a dedicated research and policy institute aimed at enhancing the efficiency, effectiveness, and resilience of a country's defence industrial base. MoDP in close coordination with Joint Staff Headquarters and Services Headquarters to form the relevant forum of this specialized think tank (for details at Annexure - E)

4.25. Defence Production Export & Promotion. MoDP with its relevant EDs will centrally be controlling, coordinating and organizing exports. Will offer one window service for Defence Exports to both public and private sectors.

4.25.1. All Public/ Private defence production organizations involved in exports will work under the directions of MoDP.

4.25.2. Private Marketing entities/ firms should be encouraged/ directed to get registered.

4.26. Continuous Review of the Policy. National security priorities/ defence needs are continuously changing. Regular review and adaptation of the priorities based on changes in the security environment, emerging threats, and technological advancements is a must. Where needed Line ministry to allow for flexibility in policy implementation to adapt to changing circumstances, technological advancements, and emerging threats.

ENABLERS FOR POLICY

5.1. MoIP for Industry & Production. Incentivize private sector industries to venture in the defence production sector through share in sector projects, programs and activities.

5.2. MoST for Academia. Development of local quality standards and certification bodies to endorse indigenous defence production related product to facilitate local vendors and reduce their cost of production by avoiding international certifications in coordination with MoDP.

5.3. MoITT for Software. MoDP may route the proposed policy through the Ministry of IT&T for incorporation of their sector specific input and harmonization as their policies impact defence production cycle. Technical support of MoIT&T for digitization for MoDP in line with Digital Pakistan 2025 initiative to support better visibility of processes and one window operation.

5.4. MoF, Revenue and Eco Affairs for Incentives and Rebates.

5.4.1. Matters related to amendments in the schedules of taxation on machinery, plants, equipment may be assigned to Sub-Committee at the 'Secretaries Committee'.

5.4.2. Presence of Secretary DP/ Sub-Committee shall support better planning for any losses or delays in payments. Financial reforms for facilitating SMEs with options of online contracting and payments and capacity building financing.

5.4.3. Reforms for facilitating SMEs with respect to Tax exemptions, holidays and compensations especially for R&D setups and projects etc.

5.5. Ministry of Commerce

5.5.1. Establishment of closer coordination at the policy levels (Sub-Committee of 'Secretaries Committee') between MoDP and Ministry of Commerce for a coordinated stance with respect to Import and Export Policy Orders.

5.5.2. Provision of necessary coverage towards Patency and Intellectual Property Rights through Intellectual Property Organization of Pakistan.

5.6. Ministry of Defence. MoD may consider binding Services HQs in annual budgets to spend a specific amount or percentage towards Defence related R&D. This amount may be incremented annually.

5.7. Ministry of Federal Education and Professional Training

5.7.1. Development of a work force for the sector in current defence production related fields and new fields such as Drones, Robotics, AI, 3D Printing etc.

5.7.2. Earmarking share to MoDP in ongoing vocational training projects such as "Hunermand Naujawan".

5.7.3. Identification, requirement and inclusion of defence production related M.Sc and PhDs programs by Higher Education Commission in coordination with MoDP.

5.8. Other Ministries and Government Bodies. All other relevant Government Departments, Ministries and Bodies may be engaged by Ministry of Defence Production where necessary. Government through policy directive shall ask for their support where necessary.

5.9. Strategic Organizations. Strategic organizations may be asked to provide technical support and contribution towards conventional defence production sector, where required through relevant channels. Allowable sharing of their dual use technology and specific expertise like CNC machines, critical material developments, designing techniques and IT related infra towards tactical weaponry and war fighting material needs to be encouraged.

5.10. DPEs. All defence production establishments must align their mission matrices, annual layouts, project plans such that the targets and goals can be achieved. Co-production ventures within DPEs for optimum utilization of common expertise be practiced.

5.11. Academia. National academia (especially institutes in STEM fields) are breeding grounds for crucial human resource for defence production sector. Academia through HEC and MoST must be engaged to collaborate on research and development.

5.12. Private Sector. Potential of private sector otherwise dispersed over length and breadth of the country by critically evaluated, their expertise towards technical acumen, hi tech infra and quality HR be incorporated in the DPEs located in near vicinities.

INCENTIVES FOR THE LOCAL DEFENCE INDUSTRY

6.1. Introduction. Incentives for local defence industry are crucial to encourage growth, innovation and self-reliance in the sector. Some proposed incentives are enumerated below, however, MoDP may approach relevant ministry for needful.

6.1.1. Research and Development Grants. Offer grants to defence companies for research and development projects. These grants can help foster innovation, improve technology and enhance the capabilities of the local industry.

6.1.2. Tax Incentives. Provide tax breaks or reductions for defence companies, especially those investing in R&D, infrastructure development or expanding their manufacturing capacity. These incentives can include tax credits, deductions or exemptions.

6.1.3. Export Promotion Assistance. Assist local defence companies in marketing their products and services abroad. This may include subsidies for participating in international defence exhibitions, trade missions or promotional activities.

6.1.4. Customs and Tariff Benefits. Reduce or eliminate customs duties or tariffs on imported components and materials used in defence production, making it more cost effective for local manufacturers.

6.1.5. Defence Procurement Preferences. Implement policies that give preference to locally produced defence equipment in government procurement processes. This not only supports the local industry but also strengthens national security.

6.1.6. Public-Private Partnerships (PPP). Encourage PPPs between government entities and private defence companies. These partnerships can lead to shared investment and resource pooling for specific projects.

6.1.7. Export Financing. Provide export financing and credit guarantees to support local defence companies in securing international contracts and export sales.

6.1.8. Subsidized Loans and Grants. Offer low-interest loans or grants to defence companies for capital investments, expansion or modernization of facilities.

6.1.9. Intellectual Property Protection. Strengthen intellectual property protection to encourage innovation in the defence sector. Ensure that companies' innovations are safeguarded and incentivize them to invest in research and development.

6.1.10. Education and Workforce Training. Invest in education and workforce training programs that align with the defence industry's needs, particularly in STEM fields. Scholarships, training partnerships and vocational programs can help develop a skilled workforce.

6.1.11. Support for Small and Medium Enterprises (SMEs). Offer tailored support programs, including grants, access to government contracts, and mentoring, to encourage SMEs to enter the defence sector and contribute to innovation.

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6.1.12. Technology Transfer and Collaboration. Facilitate technology transfer from international partners or allies and encourage local defence companies to collaborate with foreign counterparts.

6.1.13. Regulatory Simplification. Streamline regulatory processes related to defence production, export controls, and licensing to reduce bureaucratic hurdles and ensure transparency.

6.1.14. Quality Assurance and Certification Assistance. Provide support in obtaining quality certifications and compliance standards to meet international market requirements, making local products more competitive.

6.1.15. Supply Chain Development. Support the development and resilience of local supply chains, especially for critical defence components and materials.

6.1.16. Green and Sustainable Initiatives. Encourage sustainable and eco-friendly practices in defence production, and provide incentives for companies adopting environmentally responsible processes.

6.1.17. Collaborative Research Centers. Establish research and development centers, often in partnership with academic institutions, to focus on cutting-edge technologies and innovation in the defence sector.

6.1.18. Market Access Assistance - Commercialization. Provide assistance in accessing global defence markets, including market research, export strategies and market entry support (details at Annexure - F).

6.1.19. Infrastructure Investment. Invest in infrastructure, such as testing and production facilities, to modernize and expand capabilities in the local defence industry.

6.2. Transparency and Accountability. Maintain transparency and accountability in procurement and production processes, ensuring public trust in the defence industry. These incentives aim to create a conducive environment for local defence industries to thrive, enhance their capabilities, and contribute to national security while fostering economic growth and technological advancement. It's important to regularly review and adapt these incentives to align with changing needs and global market dynamics.

RESEARCH AND DEVELOPMENT FOR DEFENCE PRODUCTION

1. **Public Private Partnership.** Direct and approve collaborations between government agencies, private defence companies, and research institutions. Joint R&D projects can leverage resources and expertise for mutual benefit.
2. **Investment and Budget for R&D.** Proposal and approval of dedicated budget for R&D. Create dedicated non lapsable and lapsable defence R&D funds and grant programs to support innovative projects.
3. **Contributions from Own Earnings/ Profits.** Like all major OEMs, DPEs and other major private sector industries to generously contribute towards R&D endeavors from their own earnings. A dedicated fund be created in each establishment besides seeking assistance from donors and grants from govt/ semi govt establishments.
4. **Defence Research Organizations.** Propose measures to strengthen specialized research organizations focused on defence technologies and strategies. These institutions should have a mandate to develop cutting-edge solutions adopt, explore avenues of R&D collaborations and empowered with reasonable autonomy.
5. **Academic and Industry Collaboration.** Promoting partnerships among universities and private industry, encouraging students and researchers to work on defence-related projects. These collaborations can bring fresh perspectives and talent into the sector. Binding of major science & technology universities with R&D organizations. R&D organizations shall give research studies, projects where universities and institutes should ensure executions through graduate and undergraduate students, teams of faculty, etc.
6. **Technology Challenges and Competitions.** Proposed and approved idea challenges, project development competitions and suggest appropriate funding for government approval.
7. **Intellectual Property Rights (IPR).** Create a framework for protecting intellectual property rights to incentivize companies and research institutions to invest in R&D without fear of losing proprietary knowledge.

TRANSFER OF TECHNOLOGY (TOT) POLICY FOR DEFENCE PRODUCTS

1. **Introduction.** The transfer of technology from developed to the developing countries plays an important role in meeting the technological needs of the latter and can act as a vital enabler for achieving self-reliance and indigenization in defence production. However, the urge for transfer of technology needs to be rationalized and evaluated against important parameters of initial cost, long term economic viability, absorption capability and requirement of specialized human resource. Attributes and parameters of transfer of technology need to be carefully crafted to maximize own advantage, while catering for international policies which protect intellectual property rights and prevent 'forcing' of transfer of technology. Factor of available and willing suppliers of the required technology at the time of purchase may assume a decisive role, while negotiating attributes of transfer of technology.
2. **Transfer of Technology (ToT).** Term ToT will be used for complete or partial transfer of design, manufacturing processes and products, associated systems and sub-systems, components, devices along with sourcing information and Technical Data Package (TDP) etc, whose IP rights or know-how and know-why are owned by original equipment manufacturer(s). Transfer of such technologies will be done to the public or private sector industries or any other type of technical setup to enable development, customized manufacturing and selling as per the licensing agreement entered on behalf of Government of Pakistan.
3. **Technical Data Package.** A technical data package (TDP) may consist of applicable technical data such as models, drawings, associated lists, specifications, standards and performance requirements. It contains a technical description of an item adequate for supporting production and reproduction, engineering and logistics support. The description defines the required design configuration or performance requirements, software along with source codes (firmware and integration) and procedures.
4. **Integrated Logistics Support (ILS).** It is the management and technical process through which supportability and logistic support considerations are integrated into the design of a system or equipment and taken into account throughout its life cycle. It is the tested process of OEM by which all elements of logistic support are planned, acquired and provided in a timely and cost-effective manner suiting requirements of buyer, modalities of which are finalized at the time of conclusion of contract.
5. **Depot level Maintenance (DLM).** A base overhaul or base repair facility established with the technical assistance of OEM as per the modalities finalized at the time of conclusion of contract. DLM may or may not be part of ILS.

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6. **Factors Governing Acquisition of ToT.** For each defence product purchased from foreign supplier ILS should be integral part of the contract. DLM facility may or may not be acquired based on factors of total quantity purchased, recurring requirement, estimated life cycle and capacity of existing overhauling facilities. For acquisition of transfer of technology following factors will be considered:-

- a. Operational vitality of the equipment and envisaged requirement for extended period (minimum next twenty years).
- b. Potential of up-gradation with respect to emerging technologies in the relevant fields.
- c. Initial cost of technology transfer and long term economic viability.
- d. Absorption capability of public sector and private sector (where applicable).
- e. Applicability in multiple or additional fields.

7. **Categories of ToT.** ToT will be categorized based on the intended aim of the transfer as defined in the succeeding paras. However, all categories will include fabrication, manufacturing techniques and procedures for development of materials required, training of human resource and periodic updates on the latest adoptions and trends on the technology being transferred as integral part.

8. **ToT-1.** Transfer of technology and assembly line of a defence product along with TDP, Intellectual property rights, permission for modification, resale and export without any initial purchase of finished end product. End product intended from the technology transfer will be developed in the purchaser country starting with assembling, with a mutually agreed upon phase wise deletion program made integral part of the ToT contract. Salient attributes will be as under:-

- a. Purchaser will be facilitated to carry out an objective gap analysis based on which parameters or the transfer of technology will be finalized.
- b. Itemized cost of transfer of machinery, IP rights, training, up-gradations or any other facet will be provided to the purchaser.
- c. Legal aspects of ownership, modification and export of the end product will be covered in the contract agreement.

9. **ToT-2.** Complete transfer of technology for a particular Defence product along with Technical Data Package, which can be subsequent to initial purchase of agreed upon quantity of finished end product. This type of ToT may encompass following:-

- a. Transfer of technology of complete product or selected modules, parts and sub-assemblies along with related attributes of training and material acquisition.
- b. ToT for vital spare parts essential for sustenance of the acquired product.

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10. **ToT-3.** Transfer of technology, procedure or process, which may be inclusive of but not restricted to a particular defence product. The technology thus obtained should preferably have multiple applications covering a range of products. Purchasing country will exercise all rights of manufacturing and export of end products developed utilizing the acquired technology.

11. **ToT-4.** Any combination of above mentioned categories ToT.

12. **Acquisition and Production of Materials for ToT.** As mentioned above initial acquisition and subsequent local production of materials will be catered for while finalizing the modalities of ToT. Following aspects will be given special consideration: -

- a. Detail of composition of materials required for product development through ToT.
- b. Process sheets, procedures and techniques for development of required material and processing of raw materials.
- c. Details of sources and procurement channel for acquisition of raw materials.
- d. Conclusion of long term contracts for continuous supply of raw materials.
- e. Machines, tools and special equipment required for processing of raw materials.
- f. Training of human resource for material processing techniques.

13. **Quality Assurance of End Product.** OEM and supplier of a ToT contract will ensure provision of quality control and training for the assembly line to be established. Even after establishment of fully functional assembly line capable of delivering end product, ToT contract should bind OEM and supplier to take necessary measures to ensure end product quality assurance as per internationally acceptable standards.

14. **Training of Human Resource.** Technical training of local human resource of the purchaser will be one of the most critical aspects of the ToT contract. Following aspects will be given due consideration:-

- a. Evaluation of technical aspects requiring special emphasis after carrying out gap analysis of OEM facility and own capabilities.
- b. Identification of human resource requiring training to include engineers, technicians, management and business personnel.
- c. Mechanism for transfer of acquired knowledge and refresher training.
- d. Mechanism for keeping abreast with latest trends and evolving practices followed by OEM and supplier in the acquired technology.

15. **Monitoring and Implementation of ToT Contract.** ToT contracts will be concluded as separate contracts even if part of initial acquisition of finished end product. Payment should be linked to progress milestones defined at the time of conclusion of contract. Procurement and development agency through which the ToT contract has been concluded will be responsible for monitoring of implementation ToT.

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16. **Inland Transfer of Technology from Academia to Local Industry.** In developed countries academia has a major contribution in pioneering new concepts and emerging technologies. While the private sector concentrates on commercially viable technologies, academia requires sponsorship of industry to transform ideas and concepts into functional products. These products can be adopted by private sector or Defence industry based on their utility and potential. Some important facts of such ToT is mentioned below:-

- a. Establishment of Academia – Industry linkage for assessment of new ideas and concepts.
- b. Modalities for ownership of intellectual property rights.
- c. Sponsorship and funding for development of proof of concepts at Universities.

17. **Design Houses.** The technical know-how so gained from JVs, ToT and Offset related programmes must lead to the establishment of dedicated design houses for further innovations, development and manufacturing of own patent products and new versions.

QUALITY STANDARDS AND CERTIFICATIONS

1. **Introduction.** Meeting international standards and certifications for locally developed defence products is crucial to ensure that the products are recognized as high-quality and compliant with global requirements. Here are steps to achieve this:-

- a. **Identify Relevant Standards.** Determine which international standards and certifications are applicable to your specific defence product. These standards could include ISO (International Organization for Standardization), NATO standards, MILSTD (Military Standard) or specific industry standards.
- b. **Establish a Quality Management System (QMS).** Develop and implement a Quality Management System (QMS) within your defence manufacturing process. ISO 9001 is a widely recognized QMS standard that can serve as a good starting point. Ensure that the QMS addresses all aspects of production, including design, development, manufacturing, testing and quality control.
- c. **Document Procedures and Processes.** Document all processes, procedures, and work instructions within your organization. This documentation should include how your defence product is designed, manufactured and tested.
- d. **Train and Educate Your Team.** Provide training to your workforce on quality control, compliance, and the QMS. Employees should understand their respective roles in maintaining product quality.
- e. **Conduct Risk Assessments.** Perform risk assessments to identify potential issues or weaknesses in the manufacturing process. Implement measures to mitigate these risks.
- f. **Perform Internal Audits.** Regularly conduct internal audits of your QMS to ensure that it is being followed correctly and that product quality is maintained. Address any non-conformities and continuously improve your processes.
- g. **Seek Certification.** Depending on the standards and certifications relevant to your defence product, engage with a certification body or agency that specializes in the specific standard you are targeting. Work closely with these organizations to understand their requirements and prepare for the certification process.
- h. **Accreditation for Testing and Validation.** Ensure that your defence product undergoes thorough testing and validation to verify its compliance with international standards. Testing should cover aspects such as durability, functionality, safety, and performance.

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- i. **Document Compliance.** Maintain detailed records of all processes, tests, and quality control measures to demonstrate compliance with international standards. Keep records of certification processes and outcomes.
- j. **Continuous Improvement.** Establish a culture of continuous improvement within your organization. Regularly review and update your QMS and processes to incorporate best practices and lessons learned.
- k. **Engage with Industry Experts.** Seek advice and guidance from industry associations, experts, and consultants, who have experience in meeting international standards. Attend industry seminars, workshops, and conferences to stay informed about the latest developments and requirements in Defence manufacturing.
- l. **Regulatory Compliance.** Ensure your defence products comply with all relevant local and international regulatory requirements, including safety, environmental, and export control regulations.
- m. **Documentation and Traceability.** Implement robust documentation and traceability systems, including serial numbers, part numbers, and batch records for full accountability of the production process.
- n. **External Audits and Third-Party Inspections.** Consider having external audits and third-party inspections to verify and validate your compliance with international standards and certifications.
- o. **Customer Feedback and Adaptation.** Listen to customer feedback and make necessary improvements to your products and processes based on their input. Meeting international standards and certifications for defence products requires a commitment to quality, a well-structured QMS, and a dedication to on-going improvement. It can be a time-consuming and resource-intensive process, but the benefits include increased market access, improved product quality, and enhanced competitiveness on the global stage.

SIGNIFICANCE OF PATENTS AND INTELLECTUAL PROPERTY RIGHTS IN THE DEFENCE INDUSTRY

1. **Incentive for Innovation.** Patents and intellectual property rights in the defence industry encourage research and development of advanced military technologies. This incentive drives innovation, leading to the creation of cutting-edge defence systems and capabilities.
2. **Technological Advancement.** Intellectual property rights protect sensitive and advanced military technologies, ensuring they remain confidential and secure. This safeguards a nation's technological advantage in defence and national security.
3. **National Security.** Patents and intellectual property rights help safeguard a country's national security interests. They prevent unauthorized access or replication of critical Defence technologies, preventing potential adversaries from gaining access to sensitive information.
4. **Economic Value.** The defence industry contributes significantly to a nation's economy. Intellectual property rights allow defence contractors to protect their investments in research and development, which can involve substantial financial resources.
5. **Export Control.** Intellectual property rights play a crucial role in export control regulations. Governments can use these rights to restrict the export of sensitive military technologies, ensuring they do not fall into the wrong hands.
6. **Collaboration and Alliances.** Patents and intellectual property rights enable defence contractors to collaborate with governments and allies while protecting their interests. This facilitates international cooperation in defence research and development.
7. **Counterfeit and Unauthorized Use Prevention.** Intellectual property rights provide legal tools to combat counterfeit defence equipment and prevent unauthorized use, enhancing safety and reliability.
8. **Competitive Edge.** Defence companies with strong intellectual property portfolios gain a competitive edge by offering exclusive, advanced technologies to government customers. This can help secure contracts and maintain a strong market presence.
9. **Supply Chain Security.** Intellectual property rights protect the integrity of the defence supply chain, ensuring that components and materials used in military equipment meet security and quality standards.
10. **Deterrence.** The knowledge that a country has robust intellectual property protection in the defence sector can act as a deterrent to potential adversaries, dissuading them from pursuing aggressive actions.

11. **Conflict Resolution.** In cases of disputes or conflicts related to defence contracts or technology-sharing agreements, intellectual property laws provide a structured framework for resolving these issues.

12. **Continuity of Operations.** Intellectual property rights can help ensure the continuity of defence operations, as they protect critical technology and information even in the event of changes in government or corporate leadership. In the defence industry, patents and intellectual property rights are paramount for safeguarding national security, fostering technological innovation and maintaining a competitive edge. They strike a balance between promoting innovation and protecting sensitive information, ultimately contributing to a country's defence capabilities and interests.

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ESTABLISHMENT OF A DEFENCE PRODUCTION THINK TANK

1. **Introduction.** In light of the critical importance of defence production in ensuring national security, the creation of a **specialized think tank** focused on defence production and related matters is proposed. This think tank will serve as a dedicated research and policy institute aimed at enhancing the efficiency, effectiveness and resilience of a country's defence industrial base. The following proposal outlines the objectives, structure and the level of organization at which this think tank should operate.

2. **Objectives.** The primary objectives of the proposed defence production think tank are as follows:

- a. **Policy Analysis.** Conduct in-depth analysis of defence production policies and strategies to ensure they align with national security objectives.
- b. **Technological Advancements.** Explore emerging technologies and innovations relevant to defence production, including areas such as advanced weaponry, cyber security and artificial intelligence.
- c. **Economic Impact.** Assess the economic implications of defence production, with a focus on job creation, industrial base health and cost-effectiveness.
- d. **Supply Chain Resilience.** Evaluate the resilience of defence supply chains to guarantee the availability of critical materials and equipment, especially during crises.
- e. **International Relations.** Analyze the international aspects of defence production, including arms exports, international cooperation and their impact on global stability.
- f. **Regulatory Framework.** Examine the legal and regulatory frameworks governing Defence production, export controls, and compliance with international agreements.
- g. **Defence Industrial Base Health.** Evaluate the state of the nation's defence industrial base, its capacity to meet security needs and recommend strategies for improvement.
- h. **Cost Efficiency.** Investigate ways to reduce defence production costs without compromising quality and effectiveness.
- i. **Public Communication.** Develop strategies to effectively communicate the importance of defence production to policymakers and the public, managing public perception and engagement on defence issues.
- j. **Organizational Level.** The critical question is whether this think tank should be established at the government level or at an independent organizational level. Both approaches have their merits, but we recommend that the think tank be established

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at an organizational level independent of the government. Here are the reasons for this choice:

- (1) **Independence.** An independently operated think tank can provide unbiased and objective analysis of defence production policies and strategies, free from direct government influence.
- (2) **Diverse Expertise.** Such an organization can attract experts from various fields, including academia, industry, and government, ensuring a broader range of perspectives.
- (3) **Flexibility.** Independence allows the think tank to adapt quickly to evolving defence and technology trends, which might be challenging within government bureaucracy.
- (4) **Public Trust.** An independent think tank may enjoy greater public trust, as its recommendations are less likely to be perceived as politically motivated. However, close collaboration and information-sharing with government agencies and defence industry stakeholders are crucial for the think tank's success.

3. Proposed Structure of Think Tank:

Patron in Chief	Minister MoDP
President	Secretary (DP)
Members	Chairmen/ MDs of DPEs
	DGs (DGMP, DGDP, DGRDE & DGDEPO)
	3-4 Persons - Leading Defence Exporters/ Private Enterprises
	2-3 Person from Academia
Co Opted Members	DGs ex Service Headquarters

COMMERCIALIZATION AND PUBLIC PRIVATE PARTENERSHIP

1. **Introduction.** Commercialization can play significant role in promoting the defence production industry by creating a synergy between economic interests and national security. It's crucial to strike a balance between commercial interests and national security concerns. **Regulations and oversight** are necessary to ensure that sensitive defence technologies don't fall into the wrong hands.
2. **Increased Investment.** Commercialization attracts private sector investment by making defence projects more appealing. Companies can diversify their portfolio and tap into the defence sector, bringing much-needed capital and innovation.
3. **Cost Reduction.** The commercial sector benefits from economies of scale and advanced manufacturing techniques. This once applied to defence production, can lead to cost reduction, making it more cost-effective for governments to procure military hardware.
4. **Technology Transfer.** By promoting commercialization, the Defence industry can access cutting-edge technologies and expertise from the private sector. This can lead to the development of more advanced and efficient Defence systems.
5. **Export Opportunities.** Commercialization can help defence companies develop products with dual-use capabilities. These products can be sold in the international market, promoting defence exports and strengthening the nation's defence industry.
6. **Innovation and Competition.** Competition in commercial sector drives innovation. By involving commercial companies in defence production, the industry can benefit from the competitive drive to create better, more efficient, and cost-effective defence systems.
7. **Skill Development.** Commercial companies often have highly skilled workforces. Engaging them in defence production can lead to skill development and cross-pollination of expertise, which benefits the entire industry.
8. **Global Collaboration.** Commercial companies often have a global presence. Collaborations between defence and commercial entities can lead to international partnerships, sharing of resources, and mutual security interests.
9. **Reduced Dependency.** Relying solely on government-owned defence industries can lead to inefficiencies and dependency. Commercialization reduces this dependency, diversifying the supply chain and mitigating risks.
10. **Public-Private Partnerships.** Encouraging public-private partnerships (PPPs) in the defence production sector involves a comprehensive strategy that combines government initiatives with the active participation of the private sector. The provisions of PPP Act i.e P3A promulgated by the Federal Government shall be helpful in this regard.