

emergency operation planning. The long-term objective is not merely to remain a capable service provider, but to become a stable regional agricultural operation hub.

### **7.2 Strengthening agricultural machinery training and talent cultivation**

Machinery-centered modernization cannot be sustained if talent development falls behind infrastructure construction. Mashan Agricultural Service Center already provides technical guidance and training spaces, which creates a strong foundation for future development. However, the next step should be to shift from occasional training activities toward a more systematic and layered talent cultivation framework.

Current research provides clear evidence for the importance of training and technical capacity building. Studies on smart agricultural machinery adoption and digital agricultural transformation indicate that technology adoption depends heavily on practical training, demonstration effects, operator confidence, and digital literacy (Gong et al., 2024; Hashim et al., 2024; Li et al., 2024). Advanced machinery alone cannot improve agricultural modernization unless users understand how to operate, maintain, and coordinate the technology effectively under real production conditions.

For Mashan, a tiered training system would be particularly useful. The first level should focus on safe and standardized machinery operation. The second level should emphasize quality-oriented field management, drying control, and postharvest handling. The third level should target younger agricultural workers, cooperative members, and local service-team leaders who are capable of combining agricultural technology with management and digital skills. Such a training structure would also align closely with Zhejiang Province's policy emphasis on cultivating practical agricultural talent through modern agricultural service centers.

### **7.3 Promoting green and intelligent agricultural machinery**

The future green transformation of rice production increasingly depends on “intelligent enough” agricultural machinery rather than simply larger machinery. For Mashan Agricultural Service Center, the key issue is not whether to adopt intelligent technologies, but which technologies provide the highest practical value under local production conditions.

Recent research provides several important directions. Studies on UAV-based plant protection show that precision spraying systems can improve operational timeliness, reduce labor burden, and lower operator exposure while still maintaining effective pest-control performance under suitable conditions (Paul et al., 2024). Smart-farming studies in rice production also emphasize the value of integrating sensors, IoT systems, and digital decision-support tools into irrigation management, crop monitoring, and quality management systems (Hashim et al., 2024). In addition, grain-drying research has shown that improved drying-control systems can significantly improve grain quality retention and reduce postharvest losses (Li et al., 2024).

For Mashan, the most appropriate strategy is therefore to prioritize “practical intelligence” rather than blindly pursuing expensive technologies with limited local applicability. In practical terms, technologies that directly improve operation timing, quality consistency, or grain-loss reduction should receive priority. Precision plant-protection equipment, drying parameter monitoring systems, and machinery scheduling platforms are likely to provide more immediate value than highly complex systems that require excessive investment and technical support.

### **7.4 Enhancing digital and information-based management**

If the first stage of modern agricultural service center development focused mainly on physical infrastructure construction, the second stage increasingly focuses on digital and information-based management. Zhejiang Province's 2024 agricultural modernization policy explicitly encourages integration with provincial digital agriculture platforms and supports the establishment of online-offline integrated agricultural service systems. This policy direction is particularly relevant for Mashan because the center already manages multiple agricultural functions across a relatively large regional service area.