Government of Jammu and Kashmir
Agriculture Production Department

Draft Policy

on

Pesticide Residue Monitoring and Certification Framework:

Ensuring Food Safety, Environmental Sustainability and Traceability for GAPs

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Pesticide Residue Monitoring and Certification Framework

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Pesticide Residue Monitoring and Certification Framework:
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1. Summary

Ensuring food safety and compliance with international residue standards has emerged as a critical prerequisite for the global competitiveness of horticultural value chains. The indiscriminate and non-compliant use of synthetic pesticides in apple production—especially in high-altitude temperate regions like Kashmir—poses significant risks to consumer health, environmental sustainability, and export market access. As per the recent report of the Ministry of Agriculture and Farmers Welfare, J&K ranks second only to Uttar Pradesh, with an annual pesticide consumption of approximately 11.5 thousand metric tons, accounting for 17% of India's total pesticide use. This is disproportionate, given that J&K constitutes only 0.38% of the country's gross cultivated area. The per hectare pesticide consumption in J&K is 13.6 kg/ha, which is 27 times higher than the national average of 0.3 to 0.5 kg/ha. If we consider only 90 % pesticides are applied to apple orchards, the per-hectare usage in apples could reach up to 60 kg/ha.

This is an alarm bell for the policy planners and researchers to secure and address the concerns of the stakeholders which include the consumers, the medical health experts, the environmentalists, the apple growers and the fruit industry, who in one voice are for a policy that shall necessitate the regulated use of the pesticides following GAPs to keep the MRL at a mimimum to ensure food safety, environmental sustainability and market access. The proposed policy " **Pesticide Residue Monitoring and Certification Framework**" shall *make it mandatory for the apple growers to test their produce for pesticide residue levels at the Farmgate-Level before the sale of the fruit in the Mandis, and vice versa before they sell fruits and vegetables imported in Jammu and Kashmir from other states.* **This policy is in compliance with the directions of the MoA & FW for Monitoring of Pesticide Residues in the Agricultural Food Commodities conveyed vide DO No 3-7/2022-23/IPM dated 25-9-2024 and DO No 3-7/2022-23/IPM dated 2-1-2025. (Copies annexed)**

The technical and analytical support shall be provided by ***Research Centre for Residue and Quality Analysis (RCRQA)*** of SKUAST-Kashmir, which is a an **NABL accredited** state-of art laboratory as per ISO/IEC 17025:2017 with certificate no. TC-7945. (https://skuastkashmir.in/rcrqa/index.php). Leveraging the advancements in trace-level analytical instrumentation (GC-MS/MS, LC-MS/MS) and a science-based governance model, the proposed policy is aimed to : (i) institutionalize systematic sampling and risk-based surveillance of farmgate apple produce; (ii) certify residue-free lots aligned with MRLs under FSSAI, CODEX, and EU protocols; and (iii) build a transparent, scalable digital traceability platform. The policy outlines a three-tier implementation structure comprising Steering, Technical, and Field Implementation Committees and integrates global best practices including the USDA Pesticide Data Program, EU-RASFF model, and Japan's Positive List framework.

The strategic intent is to transition Kashmir's apple industry toward clean, compliant, and globally trusted horticultural produce, positioning J&K as a leader in safe food systems and sustainable agri-export ecosystems. This document serves as a regulatory, scientific, and operational roadmap for residue governance in temperate horticulture, aligned with national food safety priorities and India's commitments under WTO-SPS and One Health frameworks.

2. Rationale for Monitoring Farmgate Apple Samples in Kashmir

The apple industry of Jammu & Kashmir is the cornerstone of the Union Territory's agrarian economy, contributing a major share to the regional GDP and supporting over 3.5 million livelihoods across production, post-harvest, marketing, and export value chains. As one of India's leading temperate fruit crops, Kashmiri apples enjoy strong domestic and international demand. However, this sector faces a mounting challenge due to the unregulated and indiscriminate use of synthetic pesticides, often in violation of pre-harvest intervals and without adherence to approved formulations.

According to the Ministry of Agriculture & Farmers' Welfare (MoAFW, 2025), Jammu & Kashmir ranks second in the country in pesticide consumption, recording approximately 11,458 MT in 2023–24, next only to Uttar Pradesh (13,275 MT), with usage levels far exceeding the national average. Alarmingly, nearly 90% of all pesticides in J&K are applied to apple orchards, translating to roughly 60 kg per hectare—predominantly concentrated in the Kashmir Valley. This level of dependence on chemical control is unsustainable and places the region on the brink of what experts describe as a "pesticide disaster."

Excessive pesticide use, coupled with the emergence of invasive pests such as the apple blotch leaf miner and fruit borer, has intensified the frequency and proximity of insecticidal sprays to harvest. These practices have led to high terminal residues in apple fruits, threatening compliance with Maximum Residue Limits (MRLs) prescribed under FSSAI, Codex Alimentarius, and European Union regulations. The implications are severe—ranging from public health risks to trade disruptions. Increasing reports of pesticide-linked cancers and chronic ailments in Kashmir underscore the urgency of establishing a scientifically governed residue monitoring system.

Beyond health concerns, the ecological impacts are equally alarming. Pesticide residues contaminate soil, water, and air, disrupt microbial activity, and diminish soil fertility. Runoff and drift contribute to water pollution and biodiversity loss, particularly in fragile aquatic ecosystems. Persistent chemical exposure not only threatens non-target species but also accelerates pest resistance, leading to higher input costs and long-term ecological imbalance that endangers the very sustainability of apple orcharding in Kashmir.

From a trade and market perspective, unchecked pesticide use undermines the credibility of Kashmiri apples in both domestic and international markets. With importing nations—especially in Europe and the Gulf—enforcing stricter residue limits, the absence of systematic monitoring risks export rejections and loss of market access. Consumers are increasingly demanding residue-free or minimum-residue certified produce, and failure to meet these expectations could irreparably damage the brand value of Kashmir's most iconic fruit.

Against this backdrop, the establishment of a comprehensive, science-led pesticide residue monitoring and certification system is both timely and essential. Anchored by the Research Centre for Residue and Quality Analysis (RCRQA) at Sher-e-Kashmir University of Agricultural Sciences & Technology of Kashmir (SKUAST-K), in collaboration with the Agriculture

Production Department, Government of Jammu & Kashmir, the initiative aims to institutionalize a robust framework for residue surveillance, certification, and governance.

The policy proposes a structured sampling and testing system supported by state-of-the-art analytical infrastructure using GC-MS/MS and LC-MS/MS platforms under NABL-compliant protocols. These systems will enable trace-level detection of residues and ensure adherence to prescribed MRLs. A Residue-Free Certification Programme will be launched to incentivize growers who comply with safe pesticide practices, providing them with certification labels, market preference, and premium pricing.

To ensure credibility and sustainability, the governance model is designed as a three-tier institutional framework—a Steering Committee chaired by the Principal Secretary, Agriculture Production Department, for strategic oversight and inter-departmental coordination; a Technical Committee comprising national experts to harmonize methodologies with international standards; and district-level implementation teams for sampling, capacity building, and farmer engagement.

Complementing monitoring and certification, the policy envisages a Pesticide Data Programme (PDP) to generate annual residue trend data, identify high-risk zones, and enable evidence-based policy decisions. Furthermore, continuous capacity-building and awareness programmes on Good Agricultural Practices (GAPs) and Integrated Pest Management (IPM) will be rolled out through Krishi Vigyan Kendras and extension agencies to promote chemical stewardship and empower farmers to adopt safer, sustainable alternatives.

Aligned with India's National Action Plan on Food Safety, WTO-SPS compliance requirements, and the One Health approach, this initiative directly contributes to SDG 2 (Zero Hunger)**,** SDG 3 (Good Health & Well-being)**,** and SDG 12 (Responsible Consumption and Production). The framework envisions Kashmir not merely as a major producer but as a global exemplar of safe, sustainable, and residue-regulated horticulture. By transitioning from a volume-driven to a value-driven system, Jammu & Kashmir can protect consumer health, enhance farmer incomes, and secure the long-term competitiveness of its apple industry in the global marketplace.

3. Strengths of RCRQA, SKUAST-K

The Research Centre for Residue and Quality Analysis (RCRQA) at SKUAST-Kashmir (https://skuastkashmir.in/rcrqa/index.php) serves as the region's premier analytical and research facility for chemical residue surveillance, food quality assurance, and environmental monitoring. The Centre is equipped with state-of-the-art instrumentation, including Gas Chromatography–Mass Spectrometry (GC-MS/MS) and Liquid Chromatography–Mass Spectrometry (LC-MS/MS) platforms capable of detecting pesticide residues at trace and sub-trace levels in compliance with NABL and FSSAI standards. With a multidisciplinary team of scientists specializing in analytical chemistry, toxicology, environmental science, and plant protection, RCRQA has demonstrated strong expertise in residue estimation, method validation, and quality control—essential competencies for the implementation of the proposed pesticide monitoring and certification framework. The Centre has also established collaborations with national agencies such as FSSAI, ICAR, and APEDA, and has an extensive record of handling

residue analysis for export consignments and GAP validation studies. Its robust data management systems, adherence to international testing protocols, and capacity for large-scale sampling and analysis position RCRQA as a credible, scientifically rigorous, and institutionally ready nodal agency to anchor the Pesticide Residue Monitoring and Certification Programme in Jammu & Kashmir.

4. Regulatory and Policy Landscape

The policy establishs clear standards, responsibilities and enforcement mechanishms for producers and stakeholders. Key components include:

- **i.** Requirement of the apple growers (with a land of 5 Kanals and above) for testing their produce at farmgate level before marketing.
- **ii.** Regulatory requirements for systematic sampling and scientifically validated testing procedures.
- **iii.** Maximum residue limits (MRLs) harmonized with international benchmarks.
- **iv.** Guidelines for record-keeping, reporting and traceability of test results.
- **v.** Enforcement mechanisms and penalties for non-compliance.
- **vi.** Collaboration with relevant agencies and stakeholders to ensure effective monitoring and compliance.

By implementing such a robust policy framework, the aim of the government is to reinforce consumer confidence in the food supply, while promoting a culture of safety, quality, and sustainability in the apple sector.

5. Global Best Practices: Lessons for J&K

To formulate and execute an effective monitoring and certification system, it is imperative to adopt and adapt internationally accepted best practices prevalent in other nations:

- ***European Union (EU)****:* Through the Rapid Alert System for Food and Feed (RASFF), the EU implements real-time surveillance of pesticide residues. The EU also enforces strict MRLs and promotes eco-certification.
- ***United States (USDA Pesticide Data Program)****:* The USDA's PDP evaluates pesticide residues using statistically sound sampling strategies, ensuring consumer protection and informed regulatory action.
- ***Japan (Positive List System)****:* Japan permits only those pesticides that are pre-approved and conform to its Positive List. Exceeding MRLs leads to immediate rejection at the border.
- ***Recommendation for J&K***: Implement a Positive List based on approved pesticide formulations from CIB&RC, harmonize MRLs with FSSAI and CODEX, and integrate a digitized reporting platform.

6. Proposed Policy Framework

6.1 Pesticide Residue Monitoring Program:

The Pesticide Residue Monitoring Program for apples will be a structured initiative jointly governed by Deptt of Agriculture Production and SKUAST-Kashmir to assess and regulate

residue levels in farm-gate samples. Key components of a Pesticide Residue Monitoring Program may include:

- **State level Digital Data Base of the Apple Growers for traceability**: Block Chain Technology shall be deployed to track all the farmers for the varieties grown, cultural practices, pesticide use, harvesting, sampling for residue analysis, test reports, marketing etc.
- **Sampling of Fruits for Analyssis**: All fruit (apple) growers with an orchard area of 5 kanals and more, shall be required to test their fruit for pesticide residues, for three consecutive years or till the levels are below the maximum permissible levels, to enable them to market their fruit. Thereafter, sampling shall be done periodically at the farm-gate level to verify compliance with established prescribed standards and regulatory norms. University shall develop the SoPs for collecting the samples and dispatch to laboratory for analysis.
- **Certification:** After the lab reports, Certification of apple produce shall be done with star rating as tabulated under:

Star Rating	**MRL Compliance Level**	**Indicative Residue Level (as % of MRL)**	**Interpretation**	**Certification Label**
☆☆☆☆☆ (5 Stars)	Excellent	Residues Not Detected (ND) or ≤ 10% of MRL	Produce is virtually residue-free; highest safety assurance	*Residue-Free Certified*
☆☆☆☆ (4 Stars)	Very Good	>10% – 25% of MRL	Very low residues; well within safe and sustainable limits	*Low-Residue Certified*
☆☆☆ (3 Stars)	Good/ Acceptable	>25% – 50% of MRL	Acceptable for consumption, but indicates moderate chemical usage	*Compliant*
☆☆ (2 Stars)	Marginal	>50% – 75% of MRL	Borderline compliance; requires improvement in pesticide management	*Needs Improvement*
☆ (1 Star)	Poor/High Risk	>75% – 100% of MRL (but not exceeding legal limits)	Produce is near regulatory threshold; risky for trade/export	*High Residue Warning*
✕ (Non-Compliant)	Violation	Exceeds MRL	Unsafe for consumption; not eligible for trade	*Rejected*

Note: Proposed Star Rating Framework for Pesticide Residue Compliance is conceptualized by SKUAST-K / APD J&K under the Pesticide Residue Monitoring and Certification Policy, drawing on FSSAI/Codex MRL principles and private-export 'residue-free' procurement norms.

6.2 Awareness and Stakeholder Education:

- ***Awareness Campaigns:*** Public awraeness campaigns will be launched to highlight the significance of farm-gate pesticide residue monitoring in safeguarding food safety. These initiatives may be delivered through multiple platforms such as trainings, workshops, social media, dedicated websites, pamphlets, and community events.
- ***Understanding Monitoring Process:*** Providing consumers with clear and accessible information about how farm gate pesticide residue monitoring works can help demystify the process. This includes explaining how samples are collected, analysed, and monitored for compliance with safety standards.
- ***Educating Farmers:*** Educating consumers on how to interpret monitoring results can empower them to make informed decisions about the foods they purchase and consume. This involves explaining what different levels of pesticide residues mean in terms of safety and highlighting the importance of adherence to regulatory standards.
- ***Transparency and Accountability:*** Emphasizing transparency and accountability in farm gate pesticide residue monitoring efforts can help build consumer trust. Providing access to information about monitoring protocols, results, and any actions taken in response to non-compliance can demonstrate a commitment to food safety and accountability.

7. Duration of the Certification

Once farm gate sample has been successfully certified, the Certification shall remain in effect for the entire shelf-life of the product, until one of the following conditions applies:

- ✓ The entire supply of certified produce has been sold.
- ✓ A pesticide has been applied to the produce at any stage in the chain-of-custody that was not included in the testing upon which certification was granted.
- ✓ Cross-contamination of the produce has occurred at any stage in the chain-of-custody.
- ✓ As a quality control measure, certified produce from may be retested at any time, at the producer's expense, to verify certified status. In such cases, sampling may occur at the grower's location or at any point in the chain-of-custody.

8. Traceability and Integrity

The grower of a certified product is required to:

- Maintain auditable records pertaining to crop production inputs and product traceability
- Traceability of all certified products back to the field level.
- Ability to recall pesticide residue free certified produce if residues are found after certification.
- Ability to prevent co-mingling and contamination of certified produce with non-certified produce.

9. Execution Strategy and Institutional Mechanism

The successful rollout of a pesticide residue monitoring programme for apples in Kashmir requires a clearly defined execution strategy supported by robust institutional arrangements. This ensures not only the systematic implementation of monitoring activities but also the credibility, transparency, and sustainability of the entire system.

9.1 Monitoring and Evaluation Mechanism

To ensure accountability and continuous improvement, a robust monitoring and evaluation (M&E) framework will be instituted:

9.1.1 ***Steering and Technical Committees:*** A Steering Committee chaired by the Principal Secretary, Agriculture Production Department, UT of J&K, will oversee policy direction, inter-departmental coordination, and financial allocations. A Technical Committee comprising experts from SKUAST-K, FSSAI, ICAR institutes, and health/environment departments will provide scientific guidance, review sampling protocols, and validate test methodologies.

9.1.2 ***Performance Indicators:*** Key indicators such as number of samples collected and tested, percentage of compliance with MRLs, frequency of violations, corrective actions taken, and number of growers certified will be tracked on a quarterly basis.

9.1.3 ***Third-Party Audits:*** Independent third-party agencies will be engaged annually to audit the sampling, testing, and reporting processes. This will strengthen credibility, eliminate biases, and build international confidence in the system.

9.1.4 ***Feedback Mechanism:*** An interactive grievance redressal and feedback system will be integrated into the digital platform, enabling farmers, consumers, and exporters to report concerns. Regular stakeholder consultations will be held to review programme progress and incorporate suggestions.

9.1.5 ***Annual Review and Policy Refinement:*** At the end of each production season, the Steering and Technical Committees will jointly review programme outcomes, assess challenges, and propose revisions in protocols or enforcement measures. Annual review reports will be submitted to the UT Government and shared with stakeholders for transparency.

10. Extension of Pesticide Residue Monitoring to inbound Food Commodities in J&K

While apple production remains the primary focus of pesticide residue governance in Jammu & Kashmir, safeguarding public health and food safety necessitates a broader and more inclusive monitoring framework that also covers food commodities imported into the Union Territory from other states of India. Jammu & Kashmir, and particularly the Kashmir Valley, is a net importer of several fruits, vegetables, and food items, many of which are known to be associated with intensive pesticide usage regimes in their regions of origin. Commodities such as grapes, pomegranate, bananas, citrus fruits, and selected vegetables including tomatoes, capsicum, leafy greens, and cucurbits are routinely flagged at the national level for high residue incidence.

In the absence of a structured surveillance mechanism, these commodities enter local

markets unchecked, exposing consumers to cumulative pesticide risks. From a public policy and public health perspective, this is a critical gap—especially in light of the alarming rise in cancer and other non-communicable diseases reported across Kashmir, which epidemiological studies increasingly associate with chronic dietary exposure to agrochemicals. The current regulatory focus on local production alone, without oversight of inbound food flows, leaves the food safety ecosystem incomplete and ineffective.

Accordingly, the policy framework proposes the extension of pesticide residue monitoring beyond farm-gate production to include market-entry surveillance of high-risk fruits, vegetables, and food commodities sourced from outside J&K. This system would operate at strategic entry points, including wholesale mandis, terminal markets, cold storage facilities, and major distribution hubs. Samples would be collected on a risk-based frequency, prioritizing commodities with historically high pesticide loads, peak seasonal inflows, and prior non-compliance records in other states.

All inbound samples would be analyzed using the same NABL-compliant analytical protocols adopted for local produce, ensuring uniformity in detection, interpretation, and enforcement. Results would be integrated into a Unified Food Residue Surveillance Database, enabling commodity-wise, source-state-wise, and seasonal trend analysis. This data-driven approach will allow the government to identify repeat offenders, unsafe supply corridors, and commodities posing disproportionate health risks.

Importantly, the objective of this system is not to restrict inter-state trade but to ensure accountability, transparency, and consumer protection. Where repeated violations are observed, the Government may initiate corrective policy measures, including enhanced inspections, advisories to importing traders, restrictions on sourcing from specific high-risk suppliers, or mandatory compliance certification for selected commodities. In extreme cases, regulatory action under applicable food safety laws may be invoked to prevent circulation of unsafe food.

The integration of inbound commodity monitoring with the existing Pesticide Data Programme (PDP) will create a comprehensive early-warning and decision-support system for the UT. This will strengthen inter-departmental coordination between Agriculture, Food Safety, Health, and Trade authorities, while also enabling evidence-based engagement with source states and national regulatory bodies.

By extending surveillance from farm to market and from local to inbound supply chains, Jammu & Kashmir can establish a holistic food safety governance model—one that protects consumer health, addresses ecological and epidemiological risks, and reinforces public confidence in the food system. In a region facing growing health challenges and heightened environmental vulnerability, such proactive oversight is not merely regulatory prudence but a public health imperative.

11. Constitution of Steering Committee

For effective policy oversight and inter-agency coordination, a Steering Committee shall be constituted under the Chairmanship of the Principal Secretary, Agriculture Production Department, Government of Jammu & Kashmir. The Committee will serve as the apex decision-making body responsible for providing policy direction, approving annual monitoring plans, and ensuring alignment with national and international residue standards.

The Committee will comprise representatives from the Department of Horticulture, SKUAST-Kashmir, Directorate of Enforcement (Food Safety), Directorate of Agriculture, Health and Family Welfare Department, Pollution Control Board, and other relevant line departments. Members from ICAR institutions and FSSAI may be co-opted as special invitees.

The Steering Committee shall meet at least twice a year—prior to the harvest season to finalize monitoring schedules and post-harvest to review outcomes and recommend corrective measures. It will also guide resource allocation, inter-sectoral convergence, and policy refinements to strengthen the monitoring mechanism.

Steering Committee Members

Designation	**Capacity**
Principal Secretary to Government Agriculture Production Department	Chairman
Vice Chancellor, SKUAST-K / J	Member
Director Research, SKUAST-K / J	Member
Scheme Incharge, Monitoring of Pesticide Residues at National Level Ministry of Agriculture Govt. of India	Member
Director Agriculture Kashmir, GoJK	Member
Director Horticulture Kashmir, GoJK	Member
Director Horticulture Planning and Marketing, GoJK	Member
Director Law Enforcement, Agriculture Production Department, GoJK	Member
Secretary, Agriculture Produce Marketing Committee (APMC)	Member
Officer Incharge, Central Integrated Pest Management Centre, Srinagar	Member
Plant Protection Officer Kashmir, GoJK	Member
President, Kashmir Fruit Growers Association	Member
Jammu & Kashmir Kisan Board Member	Member
Prof.& Head, RCRQA	Member Secretary

ToRs for the Committee:

- To monitor pesticide residue in the state on quarterly basis to discuss and reviewe MPRL reports for compliance and necessary action
- To identify crops and regions, having a pesticide residue in order to implement integrated pest management (IPM) and good agricultural practice (GAPs)
- To sensitize all stakeholders through Jago Grahak, Jago campaign and awareness
- To provide action plan / suggestions to DA & FW on pesticide management

12. Constitution of Technical Committee

A Technical Committee shall be constituted to provide scientific, analytical, and operational guidance for the pesticide residue monitoring programme. This Committee will function under the Chairmanship of the Vice Chancellor, SKUAST-Kashmir (or nominee), with experts from Plant Protection, Entomology, Pathology, Analytical Chemistry, Food Technology, and Environmental Sciences as members. Representatives from accredited testing laboratories and officials from the Department of Horticulture and Agriculture will also be included.

The responsibilities of the Technical Committee will include:

- Developing and updating Standard Operating Procedures (SOPs) for sampling, testing, and

reporting.

- Recommending accredited laboratories and verifying analytical methods.
- Reviewing compliance with Maximum Residue Limits (MRLs).
- Advising on corrective measures and capacity-building programmes for farmers and field officers.
- Submitting technical reports and recommendations to the Steering Committee.

The Technical Committee will convene quarterly, or more frequently if required, particularly during peak apple harvesting and marketing periods.

Technical Committee Members

Designation	**Capacity**
Dr. P.K. Chakrabarty, Former Member-ASRB, DARE, New Delhi	Chairman
Dr. P. G. Shah, Retd. Residue Analyst, AAU Anand & Chairman, Scientific Panel on Pesticide Residues, FSSAI	Member
Dr. Vandana Tripathy, Network Coordinator, AINP on Pesticide Residues IARI New Delhi	Member
Dr. Cherukuri Sreenivas Rao, Professor, Entomology & Director (Planning and Monitoring Cell), ANGRAU, Guntur	Member
Dr. Kaushik Bannerjee, Director, ICAR-NRCG,Pune, Maharashtra	Member
Dr. Alok Srivastava Head Quality Control Laboratory, CSIR CFTRI	Member
Dr. Amrish Agrawal, Specialist & In Charge, Formulation Division, IPFT, Gurugram	Member
Dr. Suresh Walia, Adjunct Professor, Division of Agricultural Chemicals, ICAR- IARI, New Delhi	Member
Dr. Malik Mukhtar Prof.& Head RCRQA	Member Secretary

13. Incentivizing Good Agricultural Practice (GAP)

To make the star-rating system effective, growers who achieve 4–5 star levels must be recognized and rewarded through structured incentives. Suggested measures include:

- **Premium Market Access:** Linking high-rated produce with export markets, premium domestic retail chains, and institutional buyers.
- **Price Incentives:** Offering bonus payments or premium pricing (e.g., 10–20% higher procurement rate) for residue-free certification.
- **Residue-Free Certification & Branding:** Providing certified logos/stickers for apple cartons labeled "Residue-Free Kashmir Apples – 5 Star Quality."
- **Access to Subsidies & Schemes:** Prioritized eligibility for government schemes, subsidies on biopesticides, and training programs.
- **Recognition & Awards:** Annual recognition of "Residue-Free Apple Champions" at district and UT levels to create positive social recognition.

13.1 Implementation Strategy Based on Star Rating

The star rating framework can be rolled out in three stages:

Stage I: Institutional Setup & Awareness

- Establish a **Residue Monitoring Authority** under SKUAST-Kashmir and the Agriculture Production Department.
- Conduct awareness campaigns to inform growers, traders, and consumers about the star rating system.
- Develop SOPs for sampling, testing, and rating, ensuring scientific rigor and transparency.

Stage II: Operationalization of Testing & Rating

- **Sampling:** Collect farm-gate apple samples through accredited field teams.
- **Testing:** Analyze samples in accredited labs (GC-MS/MS, LC-MS/MS) with traceability tags.
- **Rating Assignment:** Each lot is assigned a star rating based on residue levels relative to MRLs.
- **Digital Integration:** Results are uploaded on a centralized portal accessible to growers, regulators, and buyers.

Stage III: Incentivization & Market Linkages

- **Residue-Free Certification:** Award digital and physical certificates/stickers to 4–5 star growers.
- **Market Differentiation:** Partner with JKTPO, APEDA, and private exporters to create dedicated channels for premium-rated apples.
- **Corrective Measures:** Growers consistently in 1–2 star categories receive targeted training on GAPs, integrated pest management (IPM), and safe spray schedules.
- **Enforcement:** Produce exceeding MRLs (non-compliant) is barred from trade channels to maintain food safety standards.

14. Trade Dynamics: A Paradigm Shift

This integrated star-rating and branding framework has the potential to transform the entire trade dynamics of Kashmiri apples**:**

- **Domestic Advantage:** In Indian markets such as Delhi, Mumbai, and Bengaluru, residue-free branding will fetch premium consumer demand, reducing dependence on commission agents and middlemen.
- **Export Competitiveness:** By ensuring compliance with strict international MRLs, Kashmir can regain competitiveness in European and Gulf markets, reducing risks of consignment rejection.
- **Farmer Empowerment:** Smallholders adopting GAPs can directly benefit from premium branding, improving farm incomes and livelihoods.
- **Reputation Building:** Over time, "Residue-Free Kashmir Apples" can emerge as a geographical brand asset**,** synonymous with purity, quality, and food safety—mirroring how "Kashmir Saffron" gained GI recognition.

By integrating a star-rating certification system into its pesticide residue monitoring framework, Jammu & Kashmir can build a powerful branding tool for its apple industry. The twin approach of incentivizing compliant growers and disincentivizing violators creates a balanced ecosystem that fosters sustainability, strengthens consumer confidence, and elevates the global standing of Kashmiri apples. This initiative will not only safeguard public health but also reshape trade flows, positioning Kashmir as a leader in safe and sustainable horticulture.

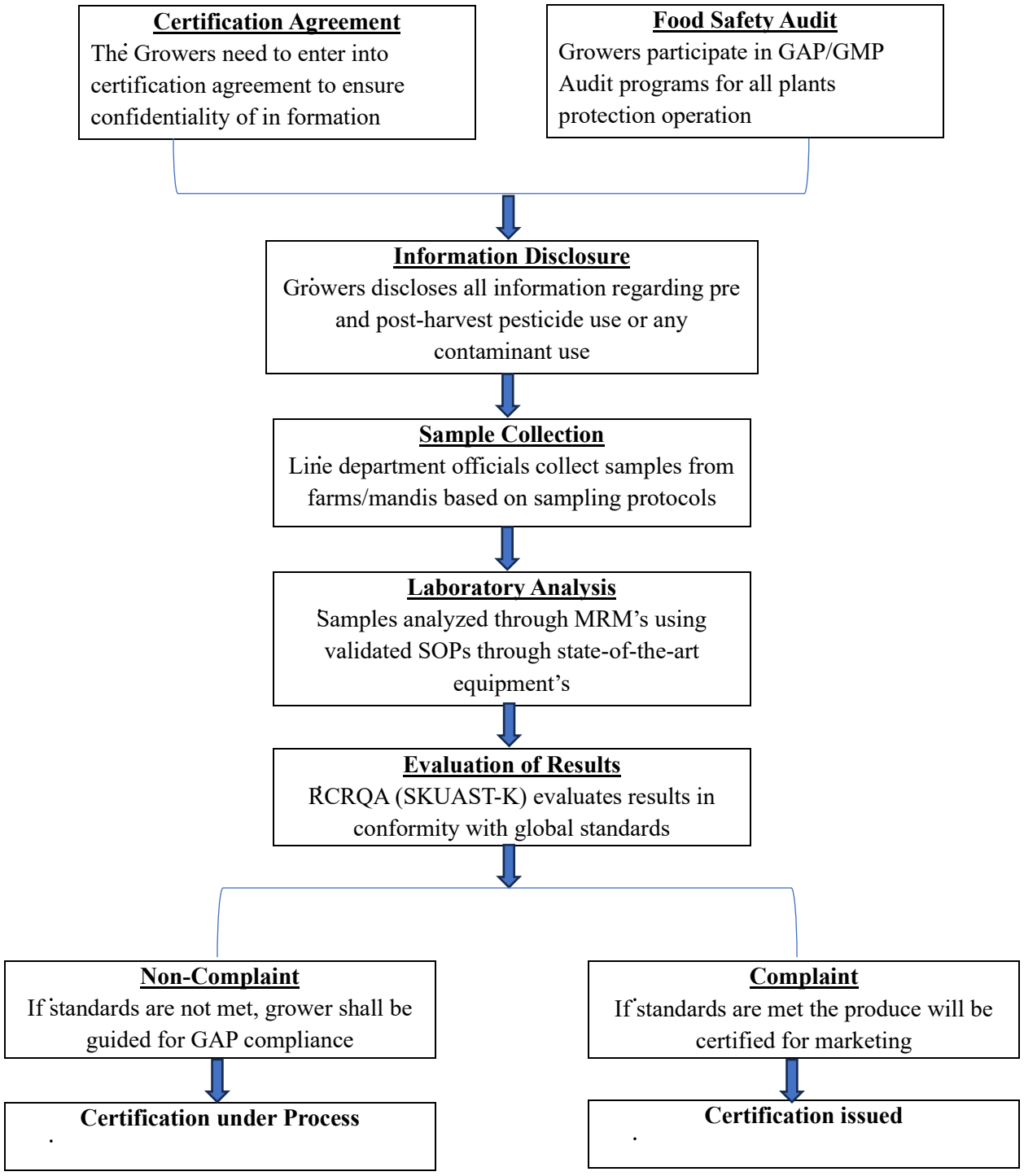
15. Nodal and Collaborating Agencies

- **Lead Implementation Body**: Research Centre for Residue and Quality Analysis (RCRQA), SKUAST-K
- **Collaborating Departments**: Agriculture Production Department, Horticulture Department, FSSAI, Law Enforcement Wing, APMC, Central Integrated Pest Management Centre

16. Three-Tiered Governance Structure

1. **Steering Committee** – The committee will provide strategic policy direction, Chaired by the Principal Secretary, Agricultural Production Department, GoJK.
2. **Technical Committee** – It will consist of eminent scientists, analysts, and regulatory experts for scientific oversight.
3. **District-Level Implementation Teams** – Field officers to undertake sampling, farmer outreach, and data collection.

Pesticide Residue Free Process Flow Chart



17. Form-1

Details of the Grower/Farmer

Name of the Grower/Farmer:
Addresss:
Contact Number:

Date & Time	Crop	Variety	Amount of sample taken	GPS coordinates	Details of pesticdes sprayed in chronological order				Remarks
					Date	Name of the pesticide	Dose/ha	Trade name	

Name & Signature of the official with date

Signature of the grower
Aadhaar No:

18. Form-2
Declaration by the Grower

I_____S/O_____R/O_____

bearing Aadhaar No:_____ do hereby declare that the information contained in the form-1 is true to the best of my knowledge and belief. I also authorize the Department of Horticulture and SKUAST-Kashmir to analyse my farmgate samples of apple for pesticide residue determination.

Signature of the grower
Aadhaar No:
Date:
Cell No.

19. Terms used in the document

CFTRI	Central Food Technological Research Institute
CSIR	Council of Scientific and Industrial research
Farm gate samples	Samples collected from farm or orchard and ready to consume.
Maximum Residue Limits (MRLs)	A maximum residue limit (MRL) is the highest level of a pesticide residue that is legally tolerated in or on food or feed when pesticides are applied correctly in accordance with Good Agricultural Practice.
RCRQA	Research Centre for Residue and Quality Analysis
SKUAST Kashmir	Sher-e-Kashmir University of Agricultural Sciences & Technology of Kashmir
Unapproved pesticides	Pesticides that are sold or distributed without a valid CIB&RC registration
Terminal residue	Any specified substance in food, agricultural commodities, or animal feed resulting from the use of a pesticides
Regulatory requirements	Regulations and guidelines to establishes tolerances (maximum legally permissible levels) for pesticide residues in food.
NABL	National Accreditation Board for Testing and Calibration Laboratories
Pesticide Residue Monitoring Program	Evaluation of pesticide residues in fruits and vegetables
Certification of pesticide residue-free produce	Certification will be done where producers are verified to contain no detectable pesticide residues
GC-MS/MS and LC-MS/MS	Gas Chromatography-Mass Spectrometry and Liquid Chromatography-Mass Spectrometry
Certification programmes	Certification programmes specify standards and criteria that apple producers must meet to qualify for pesticide residue-free certification.
Stakeholder	Farmers, vendors, producers etc
Pesticide Data Program	A comprehensive initiative designed to test a diverse array of domestically produced apple fruit samples for potential pesticide residues
Revocation of the Certified Produce	Suspension of certification showing pesticide residue laden agri-produce
FSSAI	Food Safety and Standards Authority of India
CODEX	Codex Alimentarius Commission

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मुक्तानंद अग्रवाल, आई.ए.एस.
संयुक्त सचिव
MUKTANAND AGRAWAL, I.A.S.
Joint Secretary

सत्यमेव जयते

भारत सरकार
कृषि एवं किसान कल्याण मंत्रालय
कृषि एवं किसान कल्याण विभाग
Government of India
Ministry of Agriculture & Farmers Welfare
Department of Agriculture & Farmers Welfare

DO No. 3-7/2022-23/IPM

2nd January, 2025

Dear Sir/Madam,

Kindly refer to the previous communication of this Ministry vide D.O. No. 3- 7/2022-23/IPM dated 25.09.2024 (enclosed) which outlined the implementation of integrated pest Management (IPM) approach and Good Agriculture practices (GAP) by effective monitoring of possible presence of pesticide residues in the agricultural food commodities. Additionally, it was requested to constitute a state- level committee to oversee pesticide residue monitoring and to prepare an action plan.

2. It is essential to assess the progress made and the actions initiated by the states in order to collaborate with states to jointly work together on the mission to reduce the indiscriminate use of pesticides while promoting IPM and GAP approaches across the country.

3. A report on actions taken in this regard may please be furnished to this Ministry and the steps undertaken by your department concerning the constitution of committee as well as any additional relevant initiative being undertaken.

4. Your cooperation in this regard is greatly appreciated, it will enhance our joint efforts to address the issue of indiscriminate use of pesticides and promotion of sustainable practices to improve agricultural productivity in the country.

Warm regards,

Yours sincerely,

Encl: As above

(Muktanand Agrawal)

To,
Principal Secretary (Agriculture)/Secretary (Agriculture) of all State Agriculture Department

Room No. 227, Krishi Bhawan, New Delhi-110001
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अपर सचिव
भारत सरकार
कृषि एवं किसान कल्याण मंत्रालय
कृषि एवं किसान कल्याण विभाग
कृषि भवन, नई दिल्ली-110001

सत्यमेव जयते

Faiz Ahmed Kidwai, I.A.S.
Additional Secretary
Government of India
Ministry of Agriculture & Farmers Welfare
Department of Agricultureand Farmers Welfare
Krishi Bhawan, New Delhi-110001

D.O. No. 3-7/2022-23/IPM

Dated: 25th September, 2024

Dear Sir / Madam,

As you are aware that the Ministry of Agriculture and Farmers Welfare is implementing "Monitoring of Pesticide Residues at National Level" (MPRNL) scheme, under which various agri commodities are collected and analyzed for the presence of pesticide residues. One of the major objectives of the scheme is to identify crops and regions having preponderance of pesticide residues in order to focus extension efforts for Integrated Pest Management (IPM) and Good Agriculture Practices (GAP).

The presence of pesticide residue poses a threat to human health and also, affects the country's export potential. At present Ministry is monitoring presence of pesticide residue in sample of food commodities such as vegetables, fruits, cereals, pulses, spices, curry leaves , red chilli powder, milk, water etc. from various market under the agriculture produce and marketing committee (APMC), Farm gate, water bodies etc. in the country.

Presently, the reports are shared with the State Agriculture Department with the request to monitor and give a feedback and take corrective actions accordingly. However, this activity has become a routine and much improvement has not been seen over time. Hence for effective implementation of Good Agriculture Practices (GAP) among all stakeholders to reduce / avoid pesticide residue issue in various agri commodities, the following committee may be constituted for pesticides residue monitoring at state level and preparation of action plan.

1. The Additional Chief Secretary/Principal Secretary, State Agriculture Department-**Chairman**
2. The Director, State Agriculture/Horticulture Department-**Member**
3. The Director of Research, State Agriculture Universities (SAU)-**Member**
4. I/C, Pesticide residue testing laboratories in the state (MPRNL)-**Member**
5. Representative from FSSAI -**Member**
6. The Secretary, Agriculture Produce Marketing Committee (APMC)/Mandi Board-**Member**
7. Officer In-charge, RCIPMC's/CIPMC's-**Member**
8. The Zonal Coordinator/ATARI, KVK in the state-**Member**

The constituted committee should work in the state with the followings **term of references**

1. To monitor pesticides residue in the state on quarterly basis to discuss and review the MPRNL reports for compliance and necessary action.
2. To identify crops and regions having reports of pesticide residues in order to implement Integrated Pest Management (IPM) and Good Agriculture Practices (GAP).
3. To sensitise all stakeholders through **Jago Grahak Jago** campaign/awareness programmes.
4. To provide action plan/suggestions to DA & FW on pesticide residue management.

You are requested to form a state level committee having composition of all relevant stakeholders so as to have effective monitoring and action plan to deal with the issues of pesticides residues in the state

Warm regards,

Yours sincerely,

(Faiz Ahmed Kidwai)

To,

Secretary, State Agriculture Department of all states.

The Kashmir Fruit Growers & Dealers Association

Fruit Mandi Apple Town Sopore

Email Id: fmsopore@gmail.com | Website: www.fruitmandisopore.com

Ref No: KFGDA/191

Dated: 06/11/2025

Vice Chancellor
SKUAST-K
Shalimar, Srinagar

Subject: Request for Policy Initiative on Pesticide Monitoring and Certification for Safe and Sustainable Apple Production in Kashmir

Respected Sir,

The Kashmir Fruit Growers & Dealers Association, Kashmir wishes to draw your kind attention to the growing concern over the increasing and unregulated use of pesticides in apple cultivation across the Valley. While these inputs have contributed to pest management, their excessive and often indiscriminate application has begun to pose serious challenges — from residue accumulation in fruits to adverse impacts on human health, soil fertility, biodiversity, and the region's trade credibility.

In view of these emerging risks, it has become imperative to develop a scientific, transparent, and enforceable system for pesticide residue monitoring, certification, and regulation at the farm-gate level. Establishing such an ecosystem would help ensure food safety, promote responsible pesticide use among growers, and safeguard the international reputation of Kashmiri apples as a safe and high-quality brand.

Given the institutional strength and scientific capacity of SKUAST-Kashmir, we respectfully request that the university take the lead in formulating a comprehensive Policy Framework on Pesticide Residue Monitoring and Certification in collaboration with the Agriculture Production Department, Government of J&K and other relevant stakeholders.

The Association assures full cooperation in this endeavour and stands ready to facilitate field-level engagement, awareness campaigns, and coordination with growers and traders to make the initiative successful.

We firmly believe that this step will go a long way in ensuring safe, sustainable, and globally competitive apple production and in protecting the livelihood and reputation of thousands of growers associated with this vital sector.

With kind regards,

Yours sincerely,

President
The Kashmir Fruit Growers & Dealers Association Fruit Mandi Apple Town Sopore

J&K Advisory Board For Development Of Kissans

Government of Jammu & Kashmir

To,

The Vice Chancellor

Sher-e-Kashmir University of Agricultural Sciences & Technology (SKUAST)

Jammu & Kashmir

Dated:01-10-2025

Subject: Request for Initiating Field-Level Testing of MRL (Maximum Residue Levels) for Enhancing Farmer Income, Supply Chain Regulation, and Export Readiness

Respected Sir,

I extend my warm regards and deep appreciation for the pioneering role SKUAST has been playing in transforming J&K's horticultural landscape. I am writing to highlight a critical requirement for our growers and value chain stakeholders: the initiation of field-level testing of Maximum Residue Levels (MRLs) in fruits and vegetables.

At present, one of the biggest challenges facing our growers is the lack of real-time, scientific data on pesticide residues. Globally, premium markets reward safe produce with strict adherence to residue limits. Unfortunately, in the absence of systematic field-level testing, our farmers often remain unaware of the MRL status of their produce. This creates challenges for both domestic traceability and international market access.

Field-level MRL testing, if institutionalized through SKUAST, can deliver the following benefits:

1. Traceability from Farm to Fork:

With MRL certification linked to farmer batches, buyers can trace produce to the source with confidence. This transparency will enhance consumer trust and build strong branding for J&K produce.

2. Regulation of the Supply Chain:

Regular MRL testing will help in segregating produce with acceptable standards for premium markets while diverting non-compliant produce to alternate channels. This regulation will bring efficiency, reduce rejections, and minimize market risks.

3. Rewarding Farmers with Low MRLs:

Farmers adopting responsible pesticide practices will get due recognition and higher returns. By incentivizing safer practices, MRL testing will create a fair pricing system were quality produce fetches more.

4. Export Preparedness:

As international buyers demand strict compliance with residue levels, an established system of field-level testing will make J&K produce export-ready. This can open new high-value markets in the Middle East, Europe, and beyond.

2nd Floor PIB Building Lalchowk Srinagar www.kisanboardjk.com 0194-2470115

5. Alignment with Global Standards and Certifications:

This initiative can seamlessly integrate with Global GAP, sustainability certifications, and private international programmes that emphasize food safety and environmental responsibility. By partnering with such frameworks, SKUAST can pave the way for farmers to access premium global markets while meeting strict compliance norms.

6. Sustainability and Future Competitiveness:

Field-level MRL monitoring will guide farmers towards safer and sustainable crop practices, reduce excessive chemical use, and align our production with global sustainability standards. In the long run, this will strengthen J&K's image as a hub for safe and sustainable horticulture.

Given SKUAST's scientific leadership and outreach capabilities, we believe the university is uniquely positioned to develop a structured program for field-level MRL testing in collaboration with industry stakeholders. This initiative will not only boost farmer incomes but also establish J&K as a benchmark state for traceable, safe, and export-ready horticultural produce.

We humbly request your kind attention and support for setting up a framework where SKUAST can pioneer this effort, while also partnering with international sustainability programmes, thereby directly benefiting farmers and strengthening the entire horticulture value chain.

With regards,

Izhan Javeed

Member

J&K Kisan Advisory Board

1-10-25.

Shopian.

SRINAGAR. APRIL 14, 2025, MONDAY

Greater Kashmir

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From Orchard to Oncology: How Pesticides Are Fueling Kashmir's Cancer Epidemic

Zehru Nissa
Srinagar, Apr 13

Rising Cancer Rates

Cancer cases in Kashmir are increasing, linked to multiple factors, especially lifestyle changes and pesticide exposure.

Health and Safety Gaps

Lack of guidelines, safety checks, and public awareness on the connection between pesticides and cancers.

Recommended Actions

Promote organic farming, safer agricultural practices, and conduct further research to address environmental and health risks.

Pesticides in Focus

A 2010 study confirmed a strong link between pesticide exposure and brain tumours.

Public Health Concern

Need for stronger pesticide regulation, food safety measures, and public education.

In Kashmir, the steep rise in cancers of various types is being linked to several factors, lifestyle and pesticides in the food chain being the major ones. A 2010 study proved the link between pesticide exposure and brain tumours beyond doubt, however, guidelines, safety and efficacy checks as well as awareness about the link between pesticides and cancers is missing from the public health sphere in Kashmir.

Brain tumours are most prevalent in Anantnag, Budgam and Baramulla districts. However, Kulgam and Shopian also have a significant share of brain tumours, which are more concentrated given their smaller sizes of area and population.

The study "Brain cancer and pesticide relationship in orchard farmers of Kashmir," published in the Indian Journal of Occupational and Environmental Medicine found that 90% of brain tumour patients were exposed to pesticides, with all cases involving high-grade, aggressive tumours-very. Orchards, as per the study, cover a 193109-hectare area in districts of Kashmir. Of this land, 90 percent is located in Budgam, Anantnag, Baramulla, Kupwara, Shopian, Kulgam and Pulwama.

Mancozeb, Captan and Chlorpyriphos are classified as carcinogens by the European Union and are widely sprayed in orchards of Kashmir. The estimated spray of Chlorpyrifos in Kashmir is 3186 Metric Tonnes (MT), for Mancozeb 3400 MT and 4350 MT for Captan.

In the scenario where cancers are spiking and given the established link to pesticides for brain cancer, the study findings published nearly 15 years ago, the Kashmir healthcare system must have sprung into action to safeguard the population. Stricter regulations to check the quality of pesticides, promotion of pest-resilient fruit varieties and exploring options of organic farming could help mitigate the crisis. In addition, there is a dire need to further research the presence of pesticides in food and water chains.

Mancozeb is a popular fungicide used for the prevention of apple scab and other apple diseases. It was banned in the European Union due to its health and environmental risks. Captan, another fungicide for broad disease control. In Kashmir, orchard farming forms the backbone of the economy and is the main source of income for lakhs of people. However, the lax safety protocols, cancer cancer-causing effect are multiplied where the hazardous impact of these chemicals is not just of the orchardists or people living near orchards, but far and wide areas where it leeches through water bodies.

A senior oncologist told Greater Kashmir that the lack of safety gear while spraying and poor adherence to spraying schedules and protocols continue to put orchardists' lives at risk. "The food safety and public health engineering departments have been criminally silent on pesticide contamination in the water that people consume," he said.