

TRANSACTIONS OF THE JAPANESE  
SOCIETY OF IRRIGATION, DRAINAGE  
AND RURAL ENGINEERING

## Contents

Research Papers

Rill Link Characteristics and Statistical Laws of Geomorphology of Rill Networks in Fields	TAKAGI A., SHIONO T. and NAKANO M. ... 1
A Simplified Method to Predict Sediment Yield from a Developed Rill Network Using Rill Link Characteristics	TAKAGI A., SHIONO T. and NAKANO M. ... 11
Analysis of Na- and Ca-Montmorillonite Floc Structure	KOBAYASHI S. and ADACHI Y. ... 21
Changes in the Cations Composition of Water from Irrigation to Drainage and Leaching Requirement of the Hetao Irrigation District, Inner Mongolia	AKAE T., NAKAO C., SHI Haibin and ZHANG Yiqiang ... 27
Examination Method of Present Situation of Riprap by Image Analysis	KOBAYASHI A., TAKAHASHI R., AOYAMA S. and WATABE D. ... 35
Alteration of Paddy Plots in the Rain-fed Paddy Field and Their Influences on Rice Production in Don Daeng Village, Northeast Thailand	WATANABE K., HOSHIKAWA K. and MIYAGAWA S. ... 45
Apparent Contact Angle Effects of Sand Layer on the Fingertip Velocity and Finger Width Formed during Rainfall Infiltration	ANNAKA T., KAWASHIMA M. and HANAYAMA S. ... 53

## Technical Papers

TRANSACTIONS OF THE JAPANESE  
SOCIETY OF IRRIGATION, DRAINAGE  
AND RURAL ENGINEERING

No.254

Contents

Research Papers

Migration of Japanese Dace (Ugui) in Water Zone Network Formed by Streams, Canal and River Utilized for Irrigation and Drainage	
– A Case Study of Nisikinugawa District, Tochigi Prefecture –	MORIYAMA T., FUJISAKU M., MIZUTANI M. and GOTO A. ... 1
Stable Isotope Ratio of Organisms in Small Ditches Used for Irrigation and Drainage in Hill-bottom Paddy Fields	MATSUZAWA S., MIZUTANI M., MORI A. and GOTO A. ... 11
A Strategy for Conserving Agricultural Land Resource Value of Abandoned Paddy Fields on the Premise of Restoration	
– Proposal based on a survey of restoration expense in the Oshima area Jouetsu-shi Niigata, Japan –	ARITA H., YAMAMOTO M., OHKURO T. and TOMOSYO T. ... 23
Effects of Digested Slurry and Bagasse Charcoal Applied to Shimajiri-maji Soil	
– The sugarcane and sorghum rotation cultivation considering underground water quality –	CHEN Yan, TAIRA M., UENO M. and SHINOGI Y. ... 31
Forecast of Irrigation Canal Deterioration and Joint Deterioration	KITAMURA K., HONMA S., IMAIZUMI M. and KATO T. ... 39
Fracture Energy and Tension Softening Diagram of Various Types of Grouting Mortar	ISHIGURO S. and SUZUKI T. ... 51
Required Expansion Performance of Repair Material for Crack in Concrete Canal	UENO K., NATSUKA I., NONAKA T. and ISHII M. ... 59
Study on Interaction Behavior between a Buried Structure and Ground During Sheet Pile Extraction	
– The elasto-plastic FE analysis considered contact between non-continuous ground surfaces –	MATSUSHIMA K., TANAKA T. and MOHRI Y. ... 67
Evaluation of Effect of Environment-Conscious Irrigation Canals on Fish and Shellfish Inhabitation and Water Conveyance Function	HORINO H., NAKAGIRI T. and OGINO Y. ... 77
Changes in Greenhouse Gases Emissions from a Field after Application of Digested Liquid from Methane Fermentation	FUJIKAWA T., NAKAMURA M., YUYAMA Y. ... 85
Study on Evaluation and Consideration Issue on BOD Removal in Rural Sewerage Facilities with Biofilm Processes	NAKANO T. ... 97

## Technical Papers

Development of Underground Drainage Method for Prevention of Suspended Sediment Runoff	YOSHINAGA A., SAKAI K., NAKANDAKARI T., NAKAMURA H. and FUJITA T. ... 105
Multiple Regression Models for Estimating Pollutant Concentrations at Agricultural Canals	KATO T., KODAMA T., KOBAYASHI S. and TANJI H. ... 113
Seismic Stability Analysis of Slope by Finite Element Method Employing a Strain-Softening Elasto-Plastic Model	MORI H. and TANAKA T. ... 121

## Critical Review

Characteristic and Deterioration of the Paddy Field Ecosystem - From the viewpoint of the Ecological Paddy Field Engineering -	MORI A., MIZUTANI M. and TAKAHASHI J. ... 127
---	---

## Notes

The Form of Lead Attached to the Porous Concrete	HARADA S. and KITATUJI M. ... 139
Influence of Waterweeds in Agricultural Canals on Flow Velocity Diversity and Amphipod (Gammaridea) Habitat	WATABE K., MORI A., TAKEMURA T. and KOIZUMI N. ... 141

TRANSACTIONS OF THE JAPANESE  
SOCIETY OF IRRIGATION, DRAINAGE  
AND RURAL ENGINEERING  
No.255

Contents

Research Papers

Simple Abrasion Test Equipment for Evaluation of Abrasion Resistance of Pavement Concrete	Mandula, HATTORI K., OGATA H., NATSUKA I. and GUO Shiwen	1
Effects of Removal of Deposits on the Surface Charge Property of Toyoura Sand Grain and its Result in the Capture Efficiency of Kaolintie Particle in the Column Experiment	SHIRATORI K., YAMASHITA Y. and ADACHI Y.	9
Abrasion Resistance of Concrete Pavements with Fly Ash from China After Freezing and Thawing Action	Mandula, HATTORI K. and OGATA H.	15
Local Agricultural Characteristics and Agricultural Damage by Wildlife where the Physical Prevention has Priority as an Animal Attack Control Measure	TAKEYAMA E. and KUKI Y.	23
Numerical Analysis of Dissolved Oxygen Behavior in Lake Togo using 3-dimensional Eco-hydrodynamic Model	SAI K., HARADA M., HIRAMATSU K. and MORI M.	31
Study on the Occurrence Mechanism of Hypoxic Water in the Interior Western Parts of the Ariake Sea Using the Box Model	KORIYAMA M., SEGUCHI M. and ISHITANI T.	41
Effects of Sloping Farm Field on Surface Drainage and Surface Irrigation	WAKASUGI K. and FUJIMORI S.	51
Seepage Flow along Outlet Conduit in Reservoir Embankment – Restraint of piping failure with flexible conduit –	FUJITA N., MOHRI Y. and TANAKA T.	57

Technical Papers

Sediment Control Works for Microscopic Load from Upland Fields	NAKA T., SHIMAZAKI M. and TARUYA H.	69
Changes of Physical Properties of Andisol by Incorporation of Organic Material	SASAKI T., AKASAKA H., SUZUKI R. and FUJII K.	77
Influence of Habitat Environment on the Distribution of the Freshwater Unionid Mussel <i>Inversiunio jokohamensis</i> in Hill-bottom Valley Ditches	KAKINO W. and MIZUTANI M.	83

Temperature Distribution in the Semi-urban Area under Prevailing Sea Breeze	..... TAKESHITA S., HORINO H., MITSUNO T. and NAKAGIRI T. .... 87
Potentialitiy of Water Quality Improvement in Irrigation Tanks by the Thin Layers of Soil Method	..... KAKUDO H., Kiji M., SUETSUGU A. and KUSAKABE T. .... 95
Characteristic of Fluid Forces on Stepped Ground Sill with 2 Steps	..... NAMIHIRA A., TAKAKI K., GOTO M. and KOBAYASHI H. .... 103

**Notes**

Comparison of the Snowmelt Situations of Much Snowfall Year and Little Snowfall Year in Akazawa River Basin	..... KURASHIMA E., KATO T. and MUKAIDA Y. .... 113
Evaluation of the Accuracy of Portable GPS in Logging Bulldozer's Tracks	..... KOGA K., SUGAI T., KATO K. and SUDO H. .... 115

TRANSACTIONS OF THE JAPANESE  
SOCIETY OF IRRIGATION, DRAINAGE  
AND RURAL ENGINEERING

## Contents

Research Papers

Evaluation of Ultimate Vertical Bearing Capacity for Pile with Multi-Stepped Two Diameters	SHODA D., KAWABATA T. and UCHIDA K. ... 1
Proposal of Basic Concepts on Water Serviceability in Irrigation Canal Systems	NAKA T. and TARUYA H. ... 9
Relationship between Microwave Backscattering Coefficient of Ground Covered with Dry Snow and Snow Water Equivalent	FUKUMOTO M. ... 17
Study on the Relation between Farmers' Intentions of the Measures to Decrease Agricultural Damage by Wildlife and the Characteristics of Farming Communities	KUKI Y. and TAKEYAMA E. ... 25
Design Method to Rehabilitate Old Fill-type Dam Embankment Using Cement-mixed Muddy Soil	FUKUSHIMA S., TANI S., KITAJIMA A. and GONOI J. ... 33
Inhomogeneous Cooling Process in a Closed Density Stratified Water Body	HAMAGAMI K., MORI K. and HIRAI Y. ... 47

## Technical Paper

Preliminary Study on Genetic Population of the Japanese Eight-barbel Loach in the Upper Kokai River Basin,  
Tochigi Prefecture Using Microsatellite DNA  
..... KOIZUMI N., WATABE K., GAO Zhenli, MIZUTANI M., MORI A. and TAKEMURA T. ... 55

---

## Notes

Fixation of Ammonia Obtained by Distillation from Methane Fermented Liquid Supernatant ..... YAMAOKA M., YUYAMA Y., NAKAMURA M. and HITOMI T. .... 63

Burst Speed of Japanese Dace in High Velocity Flow with Stamina Tunnel in River ..... IZUMI M., YAMAMOTO Y., YATAYA K. and KAMIYAMA K. .... 65

TRANSACTIONS OF THE JAPANESE  
SOCIETY OF IRRIGATION, DRAINAGE  
AND RURAL ENGINEERING  
No.257

## Contents

Research Papers

Physico-Mechanical Processes Involved in Sediment Generation in a Simulated Acid Soil	ANDRY Henintsoa, YAMAMOTO T., RASIAH Velu and FUKADA M. ... 1
Effect of Cyclic Irrigation on Reduction of Net Effluent Loadings of Nitrogen and Phosphorus during Sunny Days in Irrigation Period after Puddling Season	HAMA T., NAKAMURA K., KAWASHIMA S. and MITSUNO T. ... 11
Recycling of Fine Demolished Concrete as Functional Overlying Sand	HYODO M., KUWABARA T., SATO S. and NONAKA T. ... 19
Backgrounds and Problems of Animal Attack Control Measure Differed by Choice Behavior of the Measures – Analysis of the questionnaire to municipalities of Wakayama Prefecture –	TAKEYAMA E. and KUKI Y. ... 27
Solidification of Soft Ariake Clay by Mixing with Fly Ash-Based Geopolymer	SINOLUNGAN Meldi T.M., KOUMOTO T., KONDO F. and ZAHO Yuqing ... 35

## Technical Paper

Influence of the Crop-Changed Paddy Plot on Water Balance in an Adjacent Paddy Plot in Low-lying Rice Field Area	..... SAKATA S., NAKAMURA K. and MITSUNO T. .... 43
Seasonal and Interannual Change in Under-drainage Ability in Clayey Paddy Fields	..... YOSHIDA S. ADACHI K. and TANIMOTO T. .... 51
Optimum Irrigation Scheduling for a Cucumber Field in a Chinese Style Greenhouse – A case of Yan'an district on the Loess Plateau –	..... BAI Yanmei, INOSAKO K., LIANG Yinli, INOUE M. and TAKUMA K. .... 57
Pollutant Load of Nitrogen and Phosphorus into the Lake Modified by the Concept of Background Load	..... TABUCHI T. .... 65

TRANSACTIONS OF THE JAPANESE  
SOCIETY OF IRRIGATION, DRAINAGE  
AND RURAL ENGINEERING

## Contents

Research Papers

## Technical Paper

Drainage Work on the Settling Basin to Prevent Red Soil Outflow and the Natural Drying of the Deposited Red Soil	..... FUJIMORI S., HARAGUCHI N., SHIONO T., WAKASUGI K. and NAKA T. .... 29
Evaluation of Available Moisture including Vegetated Plant on Irrigation Scheduling for Green Roof	..... TANAKA S., YAMAMOTO T., MORITANI S. and INOUE M. .... 37
Relationship between Agricultural Land Use and Nitrogen/Phosphorus Concentration of River Water in Abashiri River Basin in Hokkaido, Japan	..... OKAZAWA H., TOYODA H., SHIMADA S., SUZUKI S. and TAKEUCHI Y. .... 45
Study of Trial Performance Design and Function Countermeasures for Irrigation Canals with Deteriorated Hydraulic Performance	..... MIHARU K., TANAKA Y., MUKAI A., TARUYA H. and NAKA T. .... 51
Estimation of Soil Surface Characteristics in Peatland Using ALOS/PALSAR	..... TAKADA M., INOUE T. and TANI H. .... 57